NGA HUARAHI WAKA / ROADING

Asset Management Plan

Masterton District Council 2021 - 2031

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MASTERTON DISTRICT COUNCIL
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ABREVIATIONS	
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

ABREVIATIONS	
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 & Traffic Standard
SCI	Surface condition index
SON	Streetlight (Sodium)
STE	Smooth Travel Exposure

ABREVIATIONS	
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 Roading 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 2021-31).

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 undergone significant change in the last few years, due to changes in the wider transportation sector and changes in MDC financial and community priorities. This AMP incorporates a business case approach to determine strategic issues, which then justify the investment in the programmes of work. These justifications are measured against achievable benefits, in alignment with government transport objectives.

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

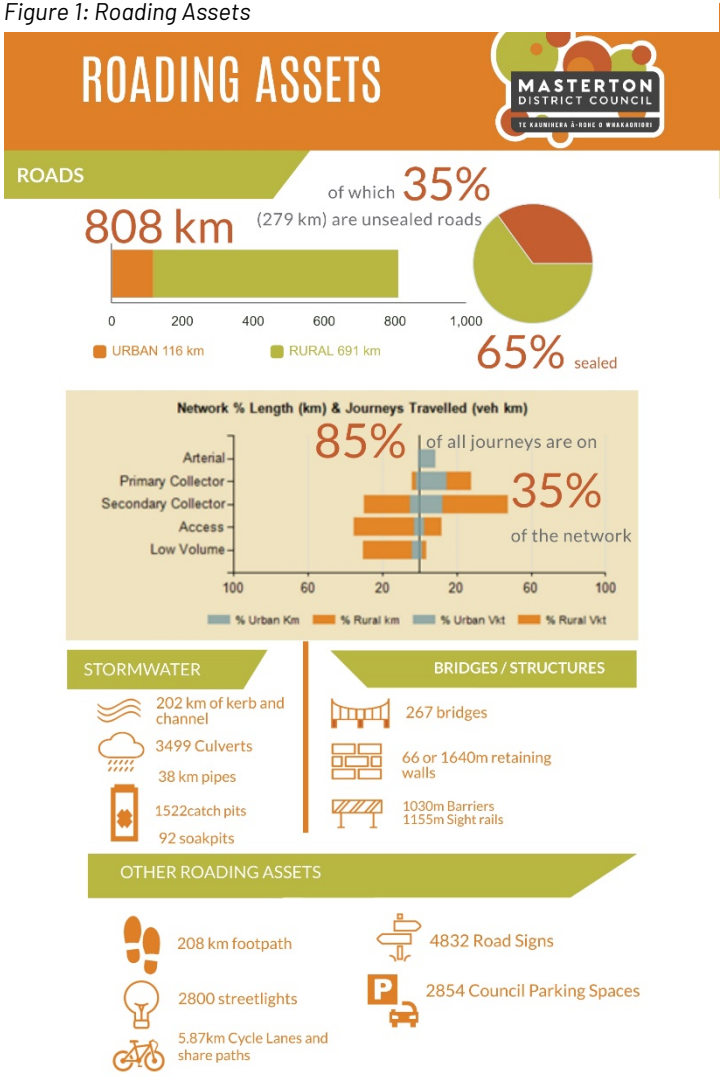
The maintenance and renewal programme of works is data driven which shows the optimal timeframes for work to be completed. The works programme has been planned to address the problems highlighted by recent recommendations raised in a technical audit. Carrying out these recommendations will reduce the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

What we manage

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

Figure 1: Roading Assets



The figure 1 above shows the quantity and range of assets MDC is responsible for within the roading network, Section 7 covers the work undertaken on the assets in more detail.

Level of Service

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

For the duration of this AMP, MDC is maintaining existing levels of service. However, some urban developing areas will require new assets to be created to provide the standard level of service expected from the community. These assets, such as footpaths and lighting improvements, also help address safety and access for pedestrians and align with outcomes of the Government Policy Statement (GPS) and the LTP. For further detail, including measures and targets for the levels of service, refer to Section 3.

Figure 3: Problem Statements

PROBLEM 1: *Aging and deteriorating network*

An aging and deteriorating roading network, combined with an increase in heavy logging/agricultural vehicles, is negatively affecting the road network in a wide range of areas.

PROBLEM 2: *Safety*

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

PROBLEM 3: *Accessibility*

The transport industry is pressuring Council to upgrade pavements and bridges to make more routes available to High Productivity Motor Vehicles (HPMV). The community is dissatisfied with accessibility and standard of our walking and cycling facilities.

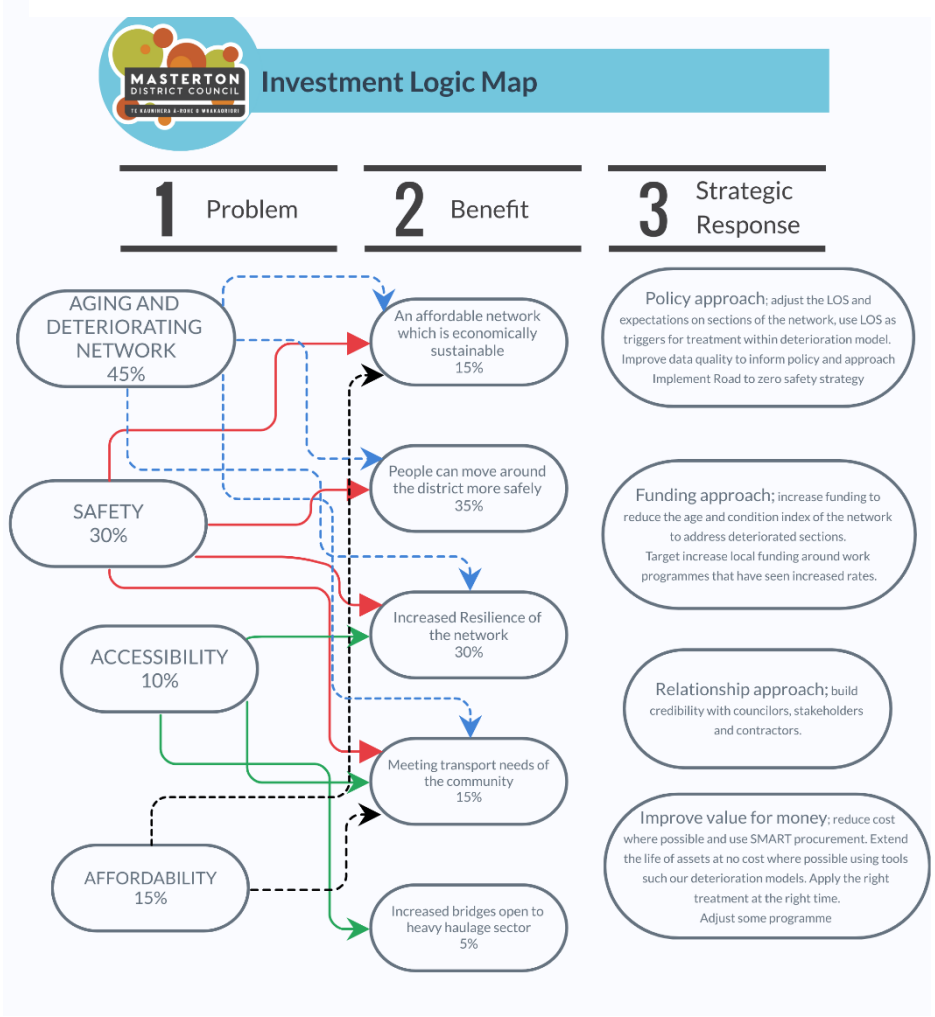
PROBLEM 4: *Affordability*

There has been a significant increase in the cost to complete work, in combination with competing council priorities from a finite funding pool, leading to deferred maintenance, renewals and improvements. The affordability of rates may become an issues for many ratepayers due to economic impacts from COVID19.

Key Issues

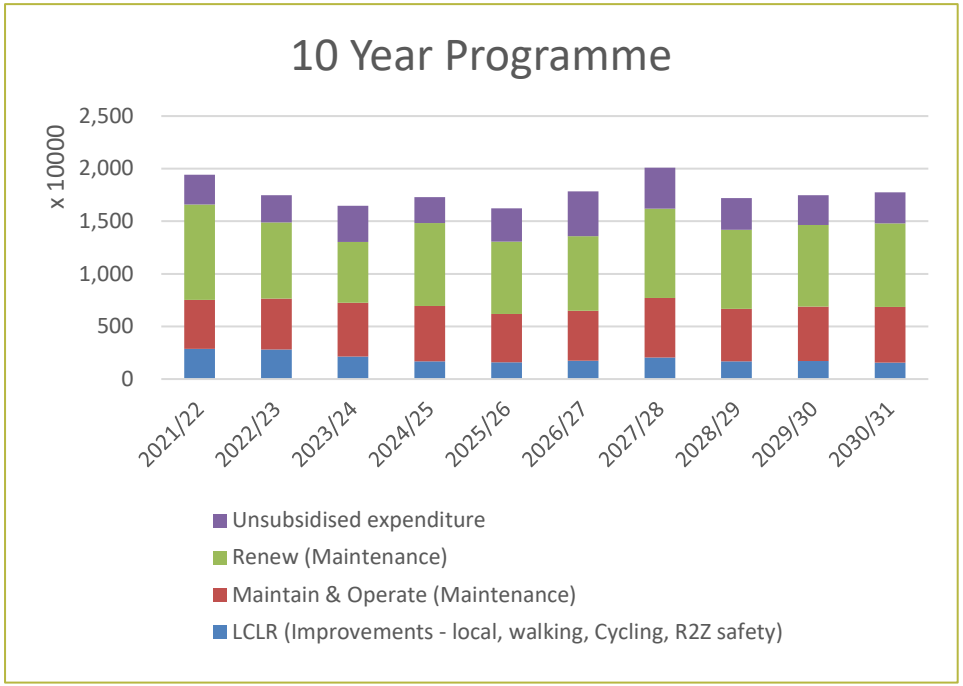
To assist in shaping the programme of works in this AMP, MDC has further developed problem statements. These focus on the major problems affecting the network, what the benefits to solving these problems would be and how MDC will respond. An overview of the problems, along with the proposed benefits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

Figure 2: Investment Logic Map



Operational Programme

The transportation maintenance, operational and renewals programme is the largest of MDC activities. Together it constitutes approximately $12 - $13 million 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 5.



It is anticipated that investment in maintenance and operations will remain relatively constant for the foreseeable future. The investment in renewals will increase 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.

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.

This programme introduces a new programme of works under the Low-Cost, Low-Risk work category, called Road to Zero, which is a government programme to reduce death and serious injuries by 40% in the next 10 years.

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 NZTA dedicated central transport funding programme.

Councils Funding Assistance Rate (FAR), the amount of financial assistance given to MDC from NZTA, will transition from 58% to 56% in 2023/24. 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 access and transport assets as at 1 July 2020 was $714,343,326. With an optimised depreciated replacement cost of $569,797,708. Annual depreciation for 2021 is $6,046,391.

Risk and Improvements

The AMP also talks of the possible risks that may lie ahead of us for Roading and summarises the levels of maintenance and renewals required; refer to Risk section. 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.

1. INTRODUCTION

1.1. BACKGROUND AND AMP HISTORY

An asset management plan is a tool in which a combination of management, financial, engineering, and other practices are applied to physical assets in pursuit of set levels of service and economic life-cycle costs.

The Roading Asset Management Plan was first developed in February 2006, revised in 2008 and 2011, and updated in 2015 to share a format with CDC and SWDC (Carterton and South Wairarapa District Councils).

This Roading Asset Management Plan supersedes Masterton District Council Asset Management Plan 2018. It is amended as required when the assets have changes implemented.

1.2. PURPOSE OF THE PLAN

The purpose of this Roading Asset Management Plan "the AM Plan" is to provide Masterton District Council "the council" with a tool to assist with the management of its roading assets "the assets". This tool combine'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.

An Asset Management Plan provides a strategy for managing the asset to deliver a service to an agreed level to the customer, at an optimum cost. The key elements in this Asset Management Plan are:

- a description of the asset including its various components
- the level of service to be delivered to the customers
- the management strategy to be followed in running the roading network
- the financial impacts of managing the assets
- an improvement plan to enable the asset to be run more efficiently
- the International Infrastructure Management Manual (NAMSG, 2015) provides the structure and format for Asset Management Plans.

1.3. RELATIONSHIP WITH OTHER PLANNING DOCUMENTS

The asset management plan is a tactical plan providing a link between the council's strategic and operational plans.

Table 1.1 Linkages between the Asset Management Plan and Other Strategic Documents

LINKAGES BETWEEN THE ASSET MANAGEMENT PLAN AND OTHER STRATEGIC DOCUMENTS	
Strategic Plans: LTP	This is the council's broad strategic direction set in the context of current and future customer requirements. The AM Plan 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 LTP.
Annual Plan	The service level options, and associated costs developed in the AM Plan 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 AM Plan.
Contracts	The service levels, strategies and information requirements contained in the AM Plan 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.

1.4. SUMMARY OF ASSETS COVERED

The summary of the MDC roading assets is set out on table 2.2. The detail of each of the asset components has been described in the respective lifecycle management chapter. Maps showing the Urban and Rural areas are in the Appendix 2 urban Streets and Appendix 3 Rural Roads.

Table 1.2 Roading assets summary

ROADING ASSETS SUMMARY			
Item	Description	Unit	Quantity
1.	Land	Million sq. m	14
2.	**Carriageway**		
	Sealed	km	532
	Unsealed	km	278
3.	**Drainage**		
	Kerb and channel	km	202
	Surface water channel	km	956
	Catchpits (includes urban stormwater)	ea.	1548
	Culverts (X-sectional area < 3.4 sq. m)	km.	38
	Bridges and culverts (X-sectional area>3.4 sq. m)	ea.	261
4.	**Footpaths**		
	Sealed/paved	km	200
	Unsealed	km	8
5.	**Traffic services**		
	Signs	ea.	4877

	Markings	km	612
	Edge marker posts	ea. (approx.)	3,000
	Raised reflectorized pavement markers	km.	98
6.	**Streetlights**		
	Urban lights	ea.	1851
	Rural lights	ea.	87
	Under veranda	ea.	301
	Amenity	ea.	13
7.	**Car parks**		
	Number of on-street parking spaces	ea.	1350
	Number of off-street parking spaces	ea.	1044

1.5. KEY STAKEHOLDERS

Current customers and stakeholders for the council's roading assets are listed below:

Customers: Ratepayers, residents, business's, local industries, forestry owners, Road Transport Forum, Heavy Haulage Association, AA Wairarapa, Destination Wairarapa, Tranzit Coach lines, Federated Farmers, cycle groups, educational institutions, emergency services.

Stakeholders: Ministry of Transport, Waka Kotahi New Zealand Transport Agency (NZTA), neighbouring local authorities, NZ Police, Greater Wellington Regional Council, contractors, subdivision developers and local Iwi including, Rangitāne o Wairarapa, and Ngāti Kahungunu ki Wairarapa

1.6. AMP DEVELOPMENT AND REVIEW PROCESS

The AM Plan acknowledges that there exist several areas where improvement to the current level of asset management detail is required. Section 9 summarises the recommendations made for developing and reviewing the asset management plan.

1.7. QUALITY ASSURANCE PROCEDURES

Formal QA procedures and QA Audit procedures are included in all new maintenance contracts, Audit NZ annually audits performance measures, and these are reported in the Annual Plan.

Waka Kotahi NZTA audits financial matters and conducts technical reviews of the roading network approximately every five years, as well NZTA carries out joint inspections of crash black spots approximately every five years.

1.8. GOALS AND OBJECTIVES OF ASSET OWNERSHIP

To meet its legal obligations, the council has adopted a funder-provider role with the Waka Kotahi (NZTA). The council delivers roading services using a mix of contracted labour (for physical works) and an in-house business unit for professional services. External consultants are engaged by the business unit when extra resources and/or specialised expertise are required.

The council attaches a high priority to the role that it plays in the provision of roading services.

1.9. REASONS AND JUSTIFICATION FOR ASSET OWNERSHIP

The council's overall objectives for this service are:

- to manage, maintain and construct all roading facilities to nationally accepted standards, with improvements where economically justified, and with New Zealand Transport Agency subsidy where available
- to ensure sustained availability of the roading network and passenger transport within the district, especially in relation to the town centre, which provides for:
  - personal mobility at levels of service satisfactory to the community and consistent with the Council's objectives for the physical environment.
  - movement of goods at levels of service consistent with efficient business operations

To meet these objectives, the council manages, maintains, and constructs the roading network as necessary.

The Council has developed strategies for continued infrastructural development to meet the community's requirements, which also aim to minimise adverse effects on the environment and offer continued support for emergency management measures.

The roading network comprises roads, bridges, traffic services and streetlights. The council also maintains footpaths, berms, trees, street furniture and parking areas to enhance and complement the roading network. For management purposes, the council distinguishes between urban and rural roads in recognition of the variations in the type and level of maintenance required.

1.10. COMMUNITY OUTCOMES AND COUNCIL VISION STATEMENTS

The council's levels of service contribute to achieving the community outcomes identified by our community – see list below. The community outcomes were identified as part of the 2006-16 LTCCP process and were widely consulted on at that time. For more information on the consultation process please refer to 'Shaping Our Future Volume 1: Community Outcomes 2006-16'. The community outcomes must be reviewed at least every six years. Council currently use the Annual, Long Term and Strategic Plans update to align community outcomes and Council visions

Table 1.3 Community outcomes and council vision statements levels of service

COMMUNITY OUTCOMES AND THE COUNCIL VISION STATEMENTS LEVELS OF SERVICE	
Community outcome	How roading assets contribute
A sustainable, healthy environment	Roading services are provided in a manner that minimises environmental impact. Provision of footpaths and cycle routes also promote 'alternative' transport options
A knowledgeable community	Contributing to road safety education through supporting the Wairarapa Road Safety Council.
An active, involved, and caring community	Providing a roading network to enable people to move around the district is critical to social wellbeing for a range of reasons, including enabling people to socialise, attend public meetings and events, go to work, school, medical appointments etc. Providing footpaths and cycle routes helps to promote opportunities for physical activity Road safety activities contribute to safe use of roading networks.

	Providing for people with disabilities and those using mobility scooters to move safely throughout the community and connect people within the community
An easy place to move around	Providing, managing and maintaining a roading network enables people to move around the district and to neighbouring districts. Road safety initiatives help to promote safe use of these networks.
A strong, resilient economy	Roading services are essential for many businesses, commercial industries and for tourism. Roading services are an essential element in any plans to grow and/or develop the district. People need to be able to access and move within the district as well as being able to access neighbouring areas.

The purpose of this Asset Management Plan is to report on the current service levels for each asset stream and how council operates these on the community's behalf. Options to vary the level of service are also reported, resulting in the presentation of a series of possible options for future maintenance or improvement.

1.11. AMP FRAMEWORK

An Asset Management Plan provides a strategy for managing the asset to deliver a service to an agreed level to the customer, at an optimum cost. The key elements in this Asset Management Plan are:

- a description of the asset including its various components
- the level of service to be delivered to the customers
- the management strategy to be followed in running the roading network
- the financial impacts of managing the assets
- an improvement plan to enable the asset to be run more efficiently.

The International Infrastructure Management Manual (IIMM, 2020) provides the structure and format for AM Plans.

Statutory requirements set the framework for the minimum standards of service which the roading assets must meet and are generally non-negotiable. The key legislation relating to the management of roading assets are listed below:

Table 1.4 Legislative Requirements

LEGISLATIVE REQUIREMENTS	
Legislation	What It Provides and/or Requires of Council
Local Government Act 1974	Empowers the council to control all roads (excluding State Highways) in the district.
Local Government Amendment Act 2002 (Clause 6 of Schedule 10)	Requires the council to comply with certain funding and financial management policies.
Local Government Act 2002 (Clause 2(1) of Schedule 10)	Requires the council to consider all reasonably practicable options and to assess the economic, environmental, social, and cultural impacts of each option.
Local Government Act 2002(Sections 76/81)	Requires the council to ensure public consultation in decision-making process.
Local Government Act 2002 (Section 102(4)(d))	Requires the council to have a policy on development contribution and to include it in its LTP.

LEGISLATIVE REQUIREMENTS	
Legislation	What It Provides and/or Requires of Council
Land Transport Management Act 2003	Requires the council to prepare a Land Transport Programme every year for the next financial year.
Resource Management Act 1991	Requires the 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 infrastructural assets.
The Building Act 1991	Requires the council to: • ensure all buildings and facilities constructed comply with the Act • produce Project Information Memoranda (PIM's) 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.
Transit NZ Act 1989	The council works in partnership with NZTA 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 NZTA. 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 NZTA.
Wairarapa Combined District Plan	This document determines land use and levels of consultation required to undertake certain kinds of work.

1.12. ASSET PLAN SOPHISTICATION TARGET LEVEL

The level of sophistication refers to the degree to which core and advanced criteria for asset management planning have been achieved. Criteria for core and advanced asset management planning are set out in the International Infrastructure Management Manual.

This plan sets out to achieve the minimum level of sophistication where corporate expectations are expressed informally and simply.

1.13. ASSET MANAGEMENT SYSTEM (RAMM & JUNOVIEWER) DATA CONFIDENCE

The quality of Masterton District Council RAMM data can be reported on using the ONRC Performance Measures Reporting Tool (ONRC PMRT.

Section 5.14 Data Quality show MDCs RAMM data quality results using ONRC PMRT 2019-20 data. It's based on a framework of indicators and data quality metrics. These metrics interrogate RAMM data for completeness, accuracy, and timeliness.

The intention is for MDC to use this assessment to identify opportunities for improvements in the way we collect, manage, and use data to support decision-making processes.

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 confidence level for the sealed roads data used in this plan is shown in Table 1.1 Where, A = Highly Reliable B = Reliable C = Uncertain D = Very uncertain

Table 1.5 Data Confidence Level (All roading assets)

Attribute	D	C	B	A
Physical Parameters				
Asset Capacity				
Asset Condition				
Valuations				
Response times				
Historical Expenditures				
Design Standards				

2. STRATEGIC CASE

2.1. INTRODUCTION

2.1.1. PURPOSE

Masterton District Council Roading Activity Management Plan (AMP) outlines how we will deliver the services that ratepayers and road users need, to go about everyday business and life.

The AMP shows how it fits with Masterton's Community Outcomes, regional transport strategies and the Government Policy Statement on transportation. This is done by clearly defining the key problems affecting the district's transport activities and the benefits of maintaining this vital economic and community infrastructure.

The AMP contains the strategy and a programme of works setting out the district's planned roading investment. This has been developed through building a strategic case and a fit for purpose programme that has clear line of sight to the defined problems.

This approach helps Council and its co-investor, the New Zealand Transport Agency (NZTA), to determine that we are doing the right work, at the right time, for the right reasons.

2.1.2. BACKGROUND

The transport network is a significant core infrastructure in the district, contributing to the social and economic well-being of residents, visitors and businesses. The transport network is essential to the continued growth and economic success of the Masterton District and must be managed, safely, efficiently, and effectively, now and in the future.

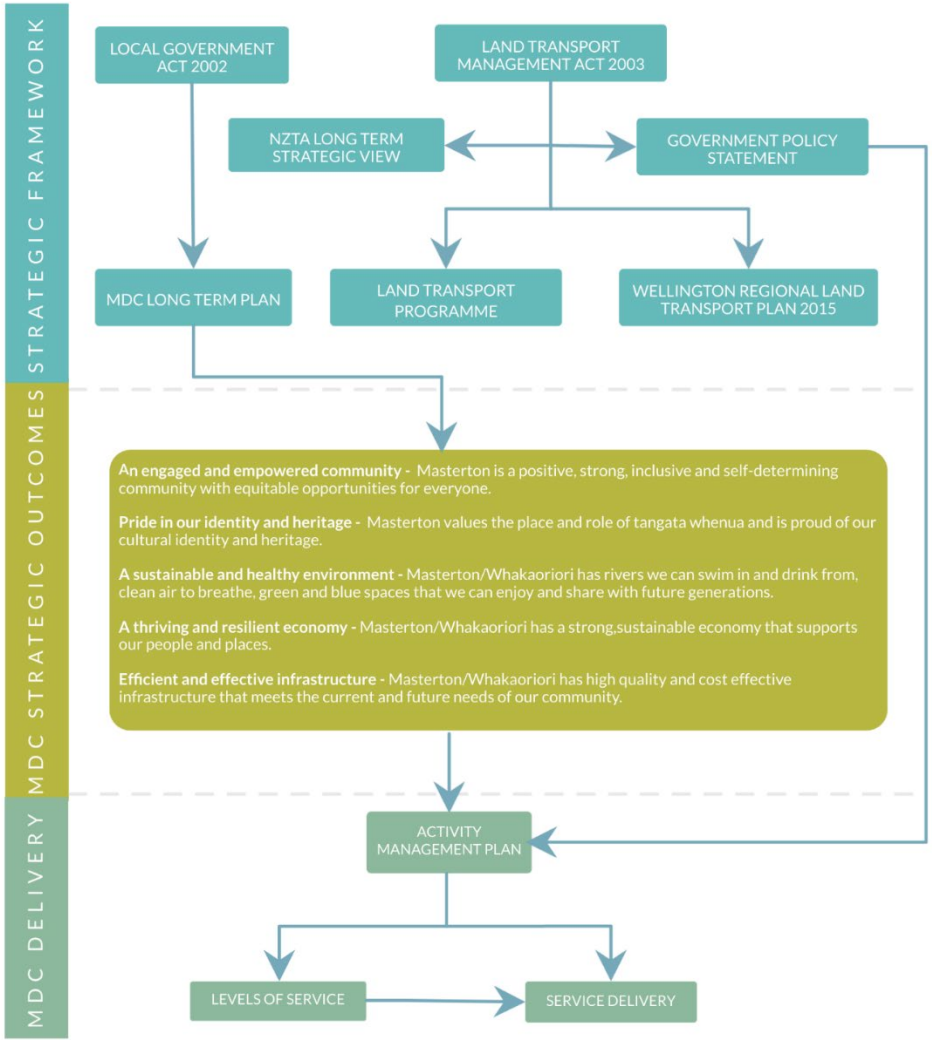
The roading activity includes roads, footpaths, cycleways, parking facilities and bridges and traffic control mechanisms (such as signage, lighting and road markings). The management of these activities will ensure a safe, efficient, and affordable transport network that helps with the movement of people, goods and services.

2.2. STRATEGIC CONTEXT

2.2.1. INTRODUCTION

This section provides the strategic context for Roading. It outlines the relevant legislative and strategic objectives for this activity. A summary of how these strategic documents align is provided in Figure 4: Strategic alignment between national, regional and local objectives below This illustrates how the Local Government Act 2002 and Land Transport Management Act 2003 align with the relevant national, regional and local strategic documents and how these documents influence the development of the AMP, Levels of Service (LOS) and the service delivery. These key driving documents are described further within the following sections.

Figure 4: Strategic alignment between national, regional, and local objectives



2.2.2. COUNCIL LONG TERM PLAN 2018-2028

In 2018, Masterton District Council adopted a Long-Term Plan that outlined Council's 10-year work programme for 2018-2028. Our strategic direction is guided by our vision and our community outcomes stated within this document. These were developed following a series of workshops with a wide range of people and organisations and are outlined below in Figure 5 below. One of Masterton's key outcomes, that links directly to roading activities, is to have efficient and effective infrastructure that meets the current and future needs of our community.

Figure 5: Masterton District Council vision and LTP outcomes

2.2.3. NZ TRANSPORT AGENCY LONG TERM STRATEGIC VIEW

At the time of writing this document the NZ Transport Agency has decided to put the review of the Transport Agency's Long-Term Strategic View on hold and instead focus on the development of Arataki – the NZ Transport Agency's plan for the land transport system. We expect the agency will share planning information around Arataki with local government during the term of this AMP and this information will be incorporated into the next review of this document

2.2.4. GOVERNMENT POLICY STATEMENT (GPS)

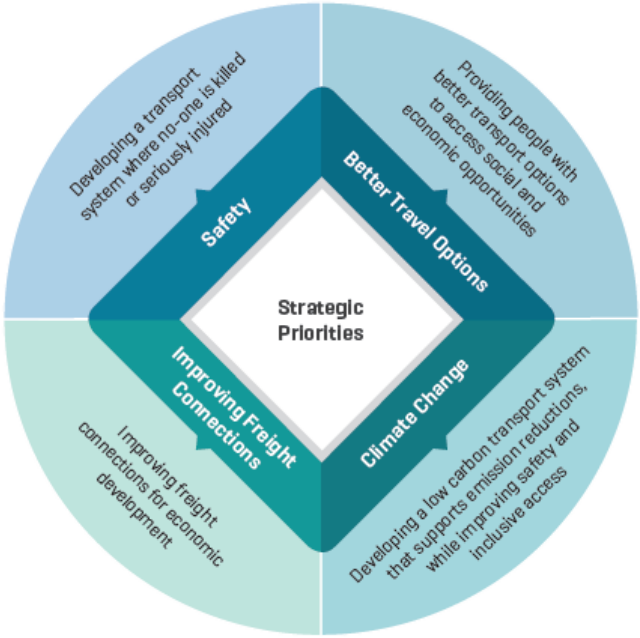
The GPS outlines the Government's strategy to guide land transport investment over the next 10 years. It also provides guidance to local government about where the Government will focus resources. The GPS operates under the Land Transport Management, Act 2003, which sets out the scope and requirements for the GPS.

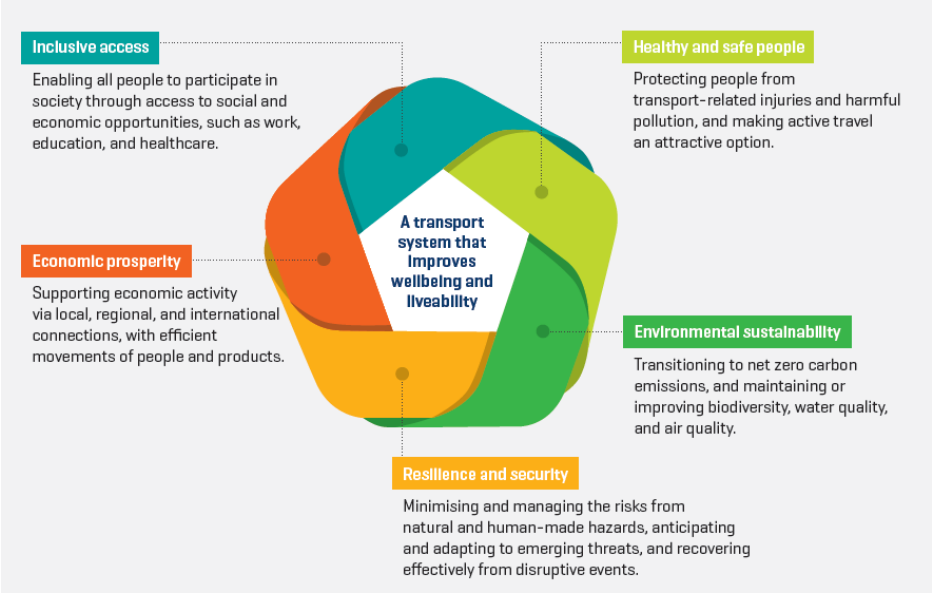
The GPS influences decisions on how money from the National Land Transport Fund will be invested across roading activity classes.

The new draft GPS, 2021 is guided by four strategic priorities for what the government wants to achieve in land transport to best contribute to improving our communities 'wellbeing and livability.

Each priority will guild investment to meet outcomes identified in the Transport Outcomes Framework, which provide direction for how these priorities should be achieved.

The Masterton 2021-23 Roading Programme has been updated to demonstrate alignment with the GPS strategic priorities and objectives.





2.2.5. WELLINGTON REGIONAL LAND TRANSPORT PLAN (RLTP)

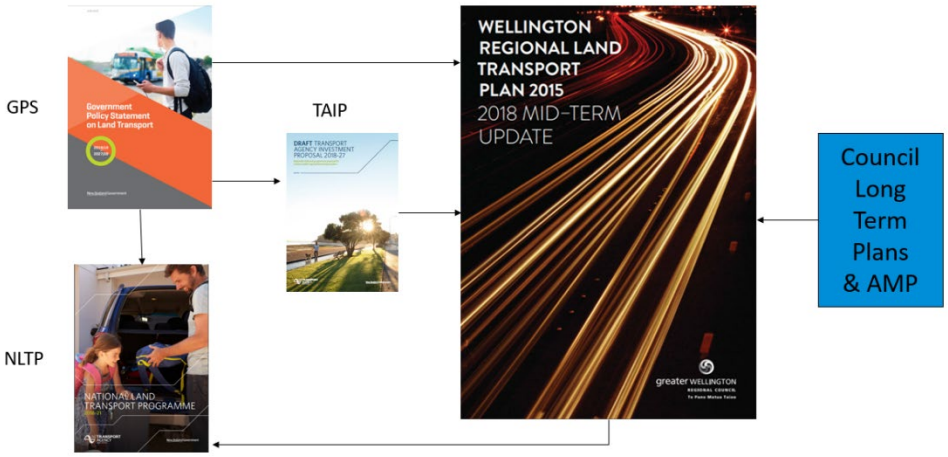
The Wellington Regional Land Transport Plan, 2015 (RLTP 2015) is a statutory document that must be prepared every six years as required by the Land Transport Management Act (LTMA) 2003 and is currently being reviewed and will be finalised in August 2021.

The role and purpose of the RLTP is

- Guides integrated land transport planning and investment
- Owned collectively by the Regional Transport Committee (all TAs, NZTA and GW)
- Sets the strategic direction to guide transport activities in Long Term Plans
- Identifies *regional transport priorities* to inform the National Land Transport Programme
- Bid for funding from the National Land Transport Fund
- Basis for communication of region's direction and priorities with stakeholders and public

The RLTP 2021 helps establish the strategic context for the programme of proposed transport activities in the Wellington Region. This includes all maintenance and operational activities promoted by each Council. Activities must be included in the RLTP in order to be eligible for National Land Transport Funding. Activities in the RLTP programme are expected to contribute to the delivery of the RLTP vision; "A connected region, with safe, accessible and livable places – where people can easily, safely and sustainably access the things that matter to them - and where goods are moved efficiently, sustainably and reliably." and to the RLTP's five strategic objectives:

- People in the Wellington region have access to good, affordable travel choices
- Transport and land use are integrated to support compact urban form, livable 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



2.2.6. OTHER KEY RESPONSES

While the strategic case will be discussed in detail section 2.5, it is recognised some other key guidance is also helpful.

2.2.6.1. Emphasis on robust evidence

Fit for purpose data collection and robust information management underpins sound decision making. A commitment to data will improve knowledge and actions.

2.2.6.2. Developing and assessment options

Rather than developing a programme and seeking funding, options are developed to be tested against the outcomes sought or level of service. Where possible, these include non-asset options such as policy or process advancement. Simplifying and streamlining processes to enable multi-modal use of the network, planning supports a move away from reliance on

the motor vehicle and all users are considered in policy and maintenance decision-making.

2.2.6.3. Smart buying

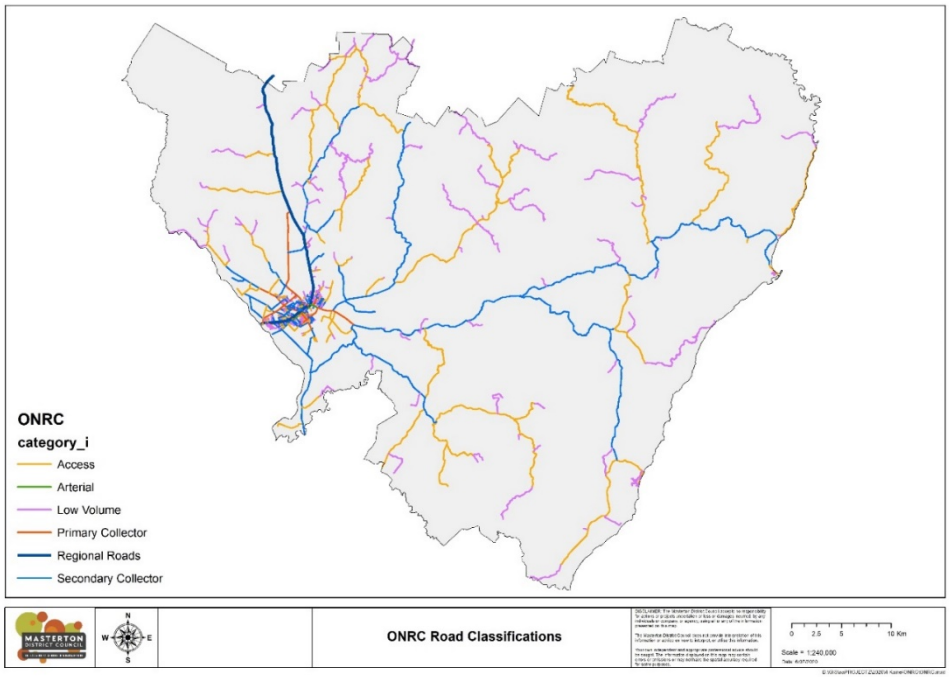
Contracts with suppliers are in place and are implemented in line with Council's NZTA approved procurement strategy. The Procurement Strategy was updated in 2019 and subsequently endorsed by NZTA. MDC has reviewed the procurement smart byer self-assessment with a score of 60 out 70.

2.2.6.4. Partnering and knowledge sharing

With other Councils and contractors: staff has been actively participating in the regional workshops and is actively pursuing building good working relationships and establishing knowledge sharing with Council's in the Wellington group as well as outside the region. MDC and Higgins Contractors have setup shared office spaces and are develop co working environment to strengthen relationships and knowledge sharing with an aim to improve our customer centric approach.

2.3. ONE NETWORK ROAD CLASSIFICATION

NZ Transport Agency and Local Government NZ formed a joint Road Efficiency Group and developed the One Network Road Classification regime. The classifications are used to categorise the roads around New Zealand based on the volume, types of traffic and connections to important points.



There are six different ONRC road categories; Masterton network is characterised by the following ONRC which is summarised in the Table 1:Network Statistics for network length (km) and journeys travelled (Million vehicle km) by ONRC Class) and Figure 7 & Figure 6

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

ONRC	URBAN (KM)	RURAL (KM)	TOTAL LENGTH (KM)	LANE (KM)	URBAN JOURNEYS (M VKT)	RURAL JOURNEYS (M VKT)	ANNUAL TOTAL JOURNEYS TRAVELLED (M VKT)	PERCENTAGE OF LENGTH
Arterial	6		6	12	9.6		9.6	1%
Primary Collector	15	17	32	64	16.5	14.7	31.3	4%
Secondary Collector	41	199	241	477	14.1	39.1	53.2	30%
Access	23	262	284	461	3.2	10.0	13.2	35%
Low Volume	31	213	244	288	1.8	2.3	4.1	30%
TOTAL NETWORK	**117**	**691**	**808**	**1,303**	**45.2**	**66.1**	**111.4**	

Figure 6: Network Percentage Length and Journeys Travelled

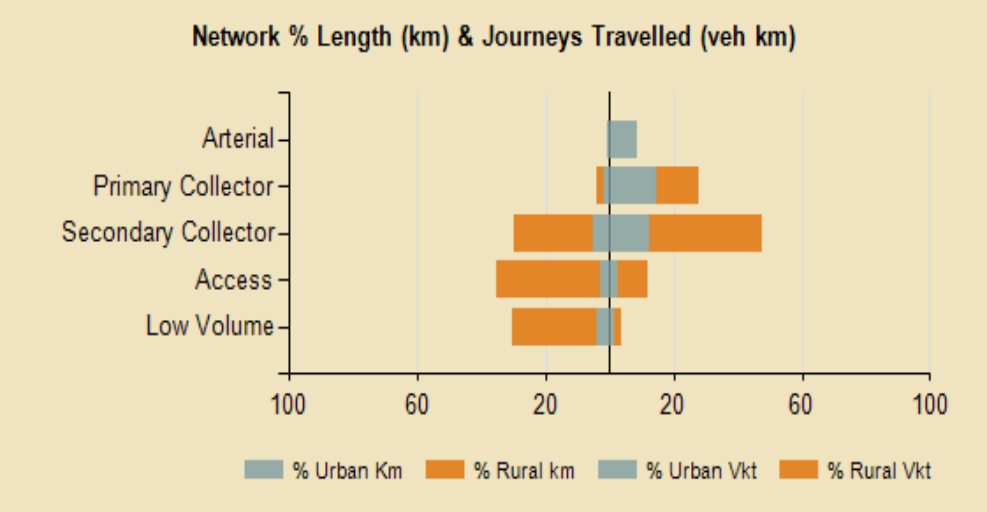
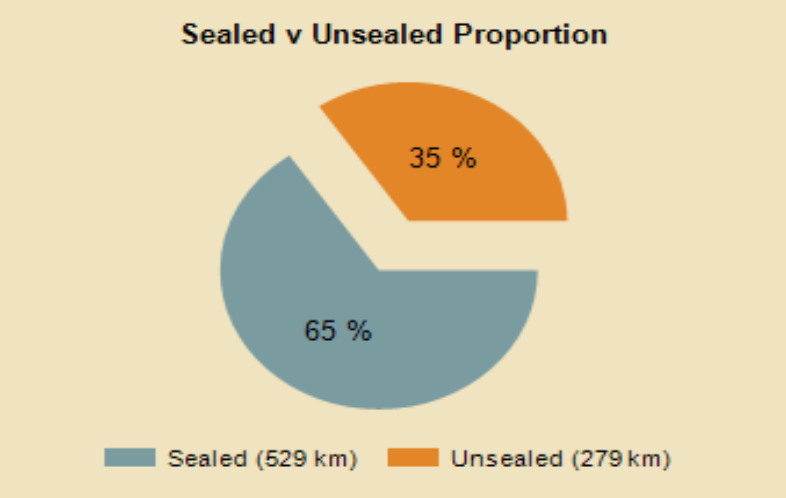


Figure 7: Sealed v Unsealed



ONRC classifications are used to compare roads throughout New Zealand both locally and on State Highways, in order to achieve national consistency in the level of service provided. This helps to direct investment decisions. All councils have implemented the ONRC.

Performance measures have been developed for ONRC to provide benchmarking information; these are around the following areas:

- Safety
- Resilience
- Amenity
- Accessibility
- Cost Efficiency

These will be discussed further in the AMP.

2.4. STRATEGIC LINK

Table 2: Strategic Links, illustrates the links between the GPS, RLTP, Council LTP and one network road classification customer level of service for roading assets. This is used to understand line of sight between key strategic documents, our Activity Management Plan (AMP) and the service delivery objectives.

Table 2: Strategic Links

GPS PRIORITIES & OUTCOMES:	RLTP STRATEGIC OBJECTIVES	LTP STRATEGIC OBJECTIVES	NATIONAL ONRC LEVELS OF SERVICE	COUNCIL AND ONE NETWORK ROAD CLASSIFICATION (ONRC) CUSTOMER LEVELS OF SERVICE
Safety • A safe system, free of death and serious injury	• People can move around the Wellington region safely	• A safe district • A safe efficient and effective infrastructure • An engaged and empowered community	**Safety** • How road users experience the safety of the road	**Department of Internal Affairs measure (Council measure)** • Number of reported injury crashes (all roads combined) **ONRC Safety** • The number of fatal and serious injuries on the network • Collective risk (fatal and serious injury rate per kilometre) • Personal risk (fatal and serious injuries by traffic volume)
Improving Freight Connections. • Efficient, reliable, safe, mode-neutral, and resilient freight transport. • A transport system that supports the movement of freight by the most appropriate mode, improving interregional corridors, and increasing resilience.	• Transport and land use are integrated to support compact urban form, liveable places, and a strong regional economy	• Efficient and effective infrastructure • A place that is accessible and easy to get around	**Resilience** • Unplanned closures with a detour or where road access is lost. • The availability and restoration of each road when there is a weather or emergency event, whether there is an alternative route available, and the road user information provided. **Accessibility** • The ease with which people are able to reach key destinations and the transport networks available to them. **Amenity** • The level of travel comfort experienced by the road user and the aesthetic aspects of the road environment	**Department of Internal Affairs measure (Council measure).** **Quality:** • Smooth travel exposure (all roads) • Roughness % km below 180 NAASRA (all roads) • Average Roughness (all roads) • Smooth travel exposure % roads smooth (all roads) **ONRC Resilience Outcomes** • The number of journeys impacted by unplanned events • The number of instances where road access is lost **Amenity Outcomes** • Smooth travel exposure • Peak roughness **Accessibility Outcomes** • Proportion of network not available to Class 1 heavy vehicles and 50 Max vehicles
Climate Change • Developing a low carbon transport system that supports emission reductions, while improving safety and inclusive access	• The impact of transport and travel on the environment is minimised	• A sustainable and healthy environment • Pride in our identity and heritage		
Better Travel Options • Provides people with better transport options to access social and economic opportunities. • Delivers the right infrastructure and services to the right level at the best cost • Highly liveable cities and towns are people-friendly places with healthy environments	• Journeys to/from and within the Wellington region are connected, resilient and reliable • People in the Wellington region have access to	• A thriving and resilient economy • Efficient and effective infrastructure	**Cost Efficiency** • Value for money and whole of life cost will be optimised in the delivery of affordable customer levels of service.	**Department of Internal Affairs measure (Council measure).** **Quality:** • Percentage roads resurfaced • Footpath (No. faults) • Footpath % defect score <50 **Responsiveness:** • % Satisfaction with transportation network • % Satisfaction with footpath surfaces • Customer service request response

that improve wellbeing and economic prosperity	good, affordable travel choices			**ONRC Cost Efficiency** • Pavement rehabilitation • Chipseal resurfacing • Asphalt resurfacing • Unsealed road metalling • Overall network cost, cost by work category

2.4.1. STRATEGIC LINKAGE BETWEEN ONRC AND PERFORMANCE

Figure 8 illustrates the comparisons between the Councils recent performance and the ONRC performance measures within the groups of safety, amenity, and cost efficiency. An assessment of the performance data has been carried out against the ONRC road hierarchy.

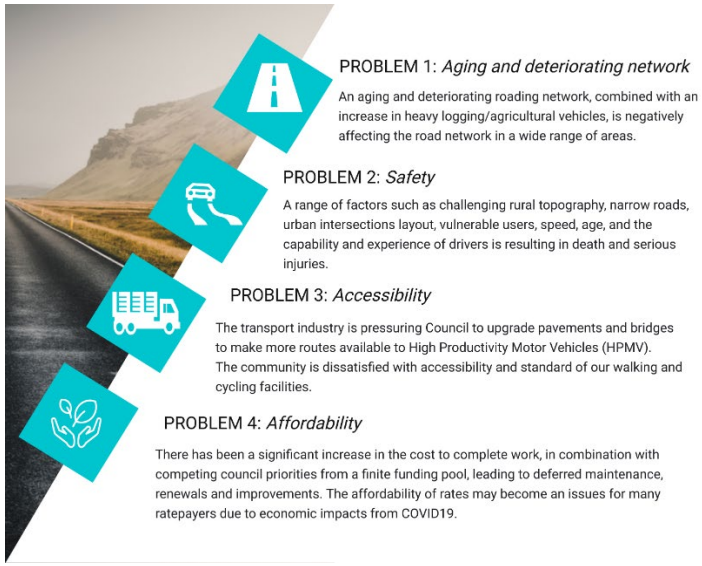
Three main points can be deduced from Figure 8: ONRC comparison with LOS:

1. The performance data suggests further investigation into the safety performance of the network is required. Some of the safety trends are significantly influenced by the number of crashes analysed. This means when there are low crash numbers (one or two crashes) further crashes can have a significant effect on the trend.
2. Smooth travel results are good when compared to NZTA target value, however, some sections in both the urban and rural roads are showing an increasing peak roughness trend. Peak roughness is an issue mainly on the arterial and collector roads; in urban areas due to significant trenching for water and services replacement work, and in rural areas where there are significant movements of heavy large vehicles on haulage routes.
3. Chipseal and asphalt resurfacing length and life appears to look relativity good when using the performance data only. However, when compared against the pavement integrity index and our peers, Masterton may be extending the life of our roads beyond recommended practice, particularly on the arterial and collector roads, which has shown both positive and negative impacts on the roading network.

Figure 8: ONRC comparison with LOS

2.5. STRATEGIC ASSESSMENT PROBLEMS

Point of entry discussions with NZTA established that full Information Logic Mapping (ILM) requirements were not warranted due to the nature of maintenance activities being cyclic and relevantly stable, with no major change anticipated during this review period. To assist in the review of the MDC's problem statements a workshop was held in November 2019 to review the problems and refine and/or identify any new problems affecting our network. As part of this review the benefits of investment and the KPIs and measures required to assess the effectiveness of the investments in the future for each problem were also reviewed. The stakeholder panel identified four key problem areas affecting the Masterton District roading network and agreed the following key problem statements.



PROBLEM 1: *Aging and deteriorating network*

An aging and deteriorating roading network, combined with an increase in heavy logging/agricultural vehicles, is negatively affecting the road network in a wide range of areas.

PROBLEM 2: *Safety*

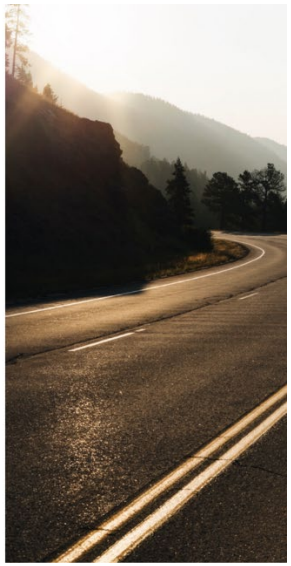
A range of factors such as challenging rural topography, narrow roads, urban intersections layout, vulnerable users, speed, age, and the capability and experience of drivers is resulting in death and serious injuries.

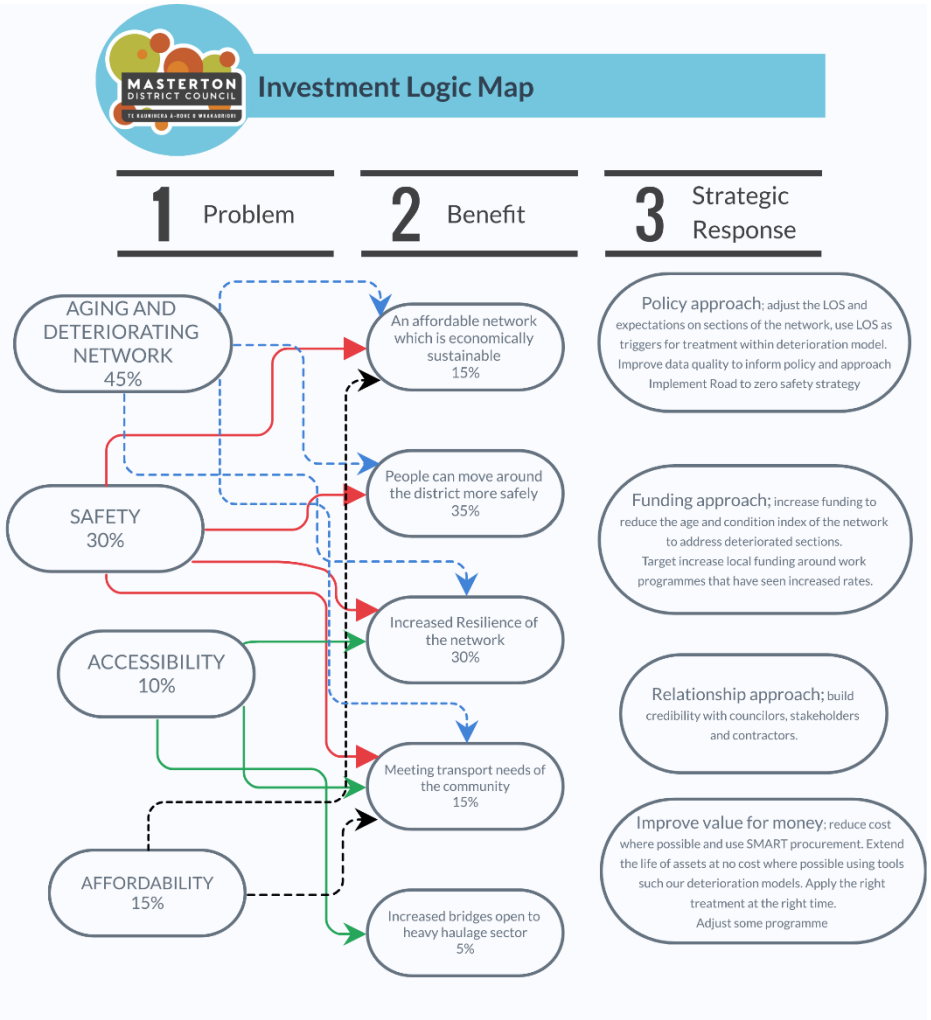
PROBLEM 3: *Accessibility*

The transport industry is pressuring Council to upgrade pavements and bridges to make more routes available to High Productivity Motor Vehicles (HPMV). The community is dissatisfied with accessibility and standard of our walking and cycling facilities.

PROBLEM 4: *Affordability*

There has been a significant increase in the cost to complete work, in combination with competing council priorities from a finite funding pool, leading to deferred maintenance, renewals and improvements. The affordability of rates may become an issues for many ratepayers due to economic impacts from COVID19.





2.5.1. PROBLEM 1 : AGING AND DETERIORATING NEWTWORK

Statement: An aging and deteriorating roading network, combined with an increase in heavy logging/agricultural vehicles, is negatively affecting the road network in a range of areas.	
CAUSE(S)	• Increasing numbers of heavy vehicles on key routes • Heavy loading on key sealed and unsealed routes beyond their original design capability • Age of surface on collector roads extended beyond recommended practices • Higher spend on low volume roads (when compared to peer group) due to traffic loading change • To many surface layers on some roads • Recent and future development in land use • Population growth in Masterton
EFFECT	• The pavement strength is not able to endure heavy loads • The durability and resilience of the network is under pressure • Maintenance dollars are diverted away from other key routes and programmes to address failing rural low volume roads • Decrease in the level of service the community expects • Safety of the network is compromised • There are missed economic opportunities and economic risks to future generations
CONSEQUENCE	• The transport network not performing as intended and resulting in unplanned reactive maintenance. Reallocation of funding to fix unsafe deteriorating roads will lead to inefficient prioritisation and planning of forward work programmes and safety disbenefits to the community.

Define the Problem

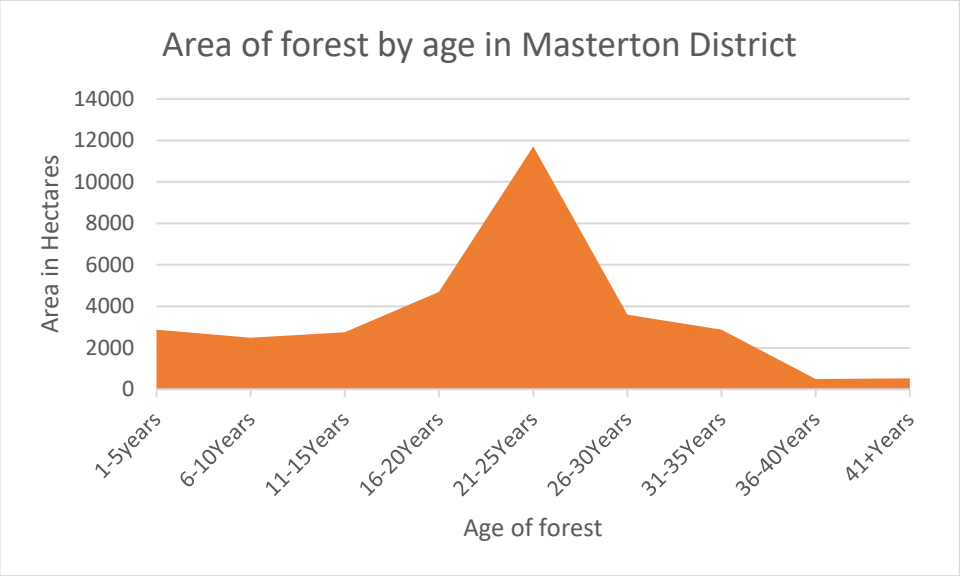
The transport infrastructure of the Masterton District is ageing and was not originally built to handle the heavy traffic that the district sees today. Many of the roads are windy and narrow, with a challenging eastern hill country topography and geology. As this infrastructure ages, or is not renewed at the appropriate time, it will result in deterioration of roads making them less safe and less reliable - unless adequate investment continues.

A NZTA audit in May 2019 concluded that while MDC road network is generally acceptable condition, there are warning signs that condition and performance are deteriorating, putting the roads at a higher risk of failing thereby increasing long-term maintenance costs and impacting aversely on the safety of the road users. Further, the network will not have the resilience to withstand impacts such as storms, spikes in road use (e.g., forestry traffic), excessively heavy vehicles and a bow wave of renewals.

There is a significant number of people moving in to the Wairarapa District, in conjunction with increased tourist numbers. The amount of forestry log haulage from the end of our low volume roads is also on the rise.

An increasing number of forestry trucks are already damaging our roads and bridges, as they cater to a greater level of forestry harvesting. This is projected to increase even further over the next 10 years, illustrated in Figure 9: 1990s Afforestation affect.

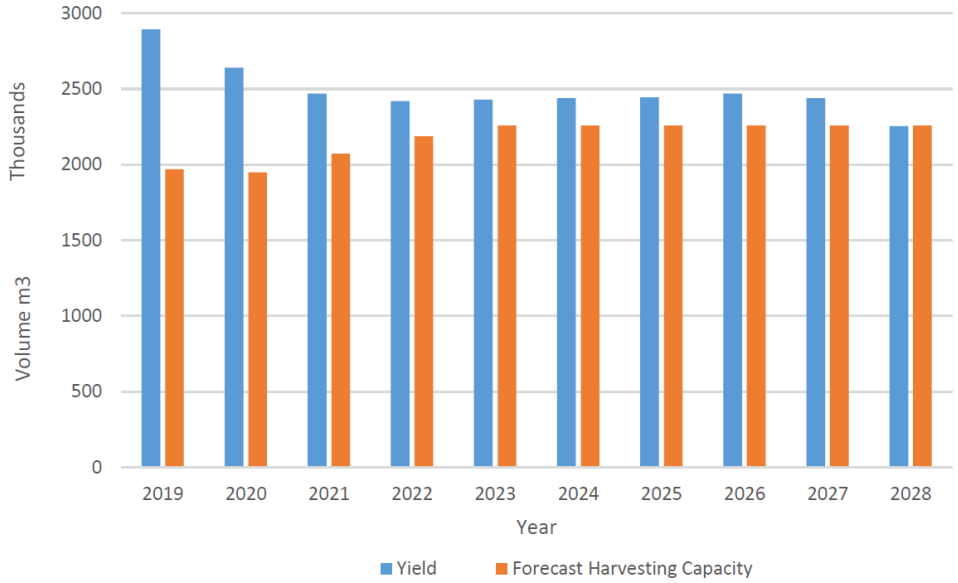
Figure 9: 1990s Afforestation affect



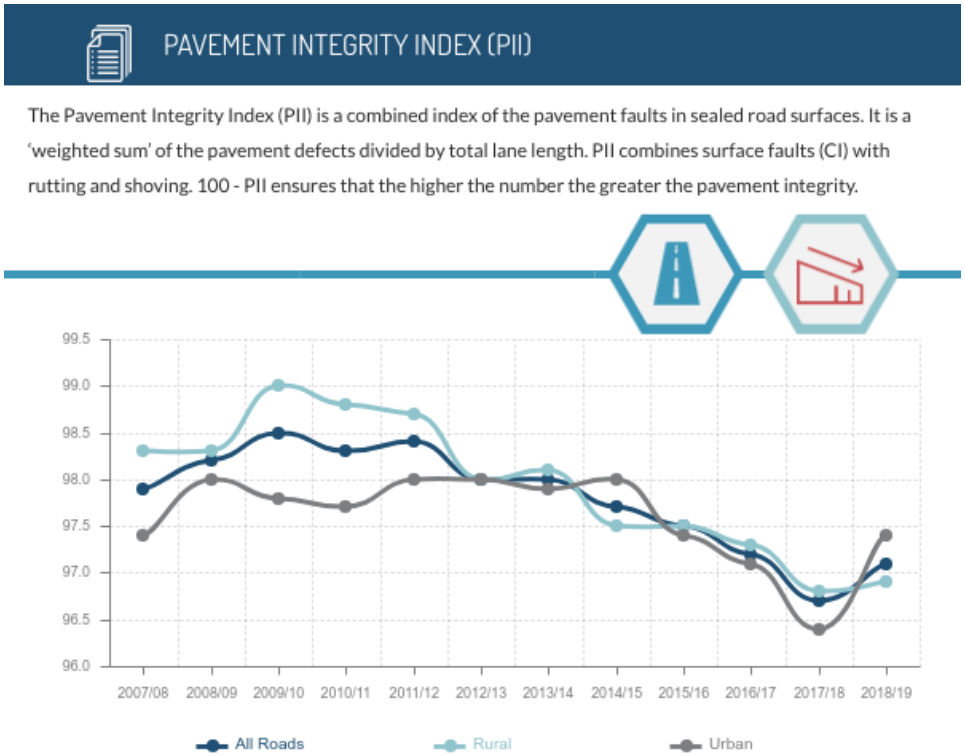
As seen in Figure 9, the spike in forest age shown at 21-25 years (optimum time for harvesting), is a primary reason why Masterton roads are experiencing an increase in forestry traffic. It is this age class that will provide the bulk of transported, harvested logs within and outside of the Wairarapa Region over the next 10 years. See Figure 10: Calculated Yields vs Forecast Harvesting Capacity

The high frequency and weight from these trucks 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 have infrastructure, in some cases, which is nearing the end of its life.

Figure 10: Calculated Yields vs Forecast Harvesting Capacity

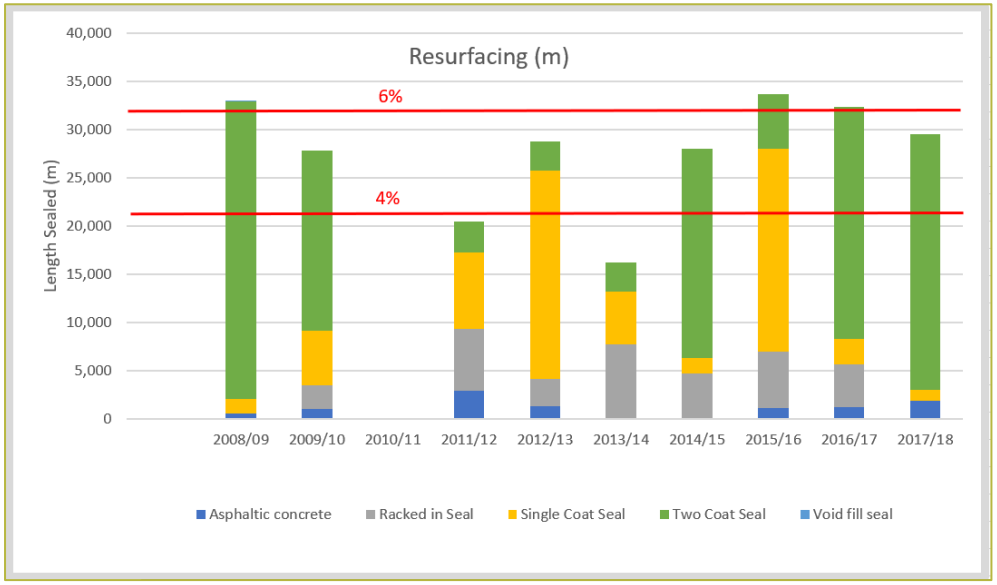


The road pavement integrity for the entire network in Masterton has been slowly declining over an 8-year period. The effect is likely to be amplified on key haulage routes.



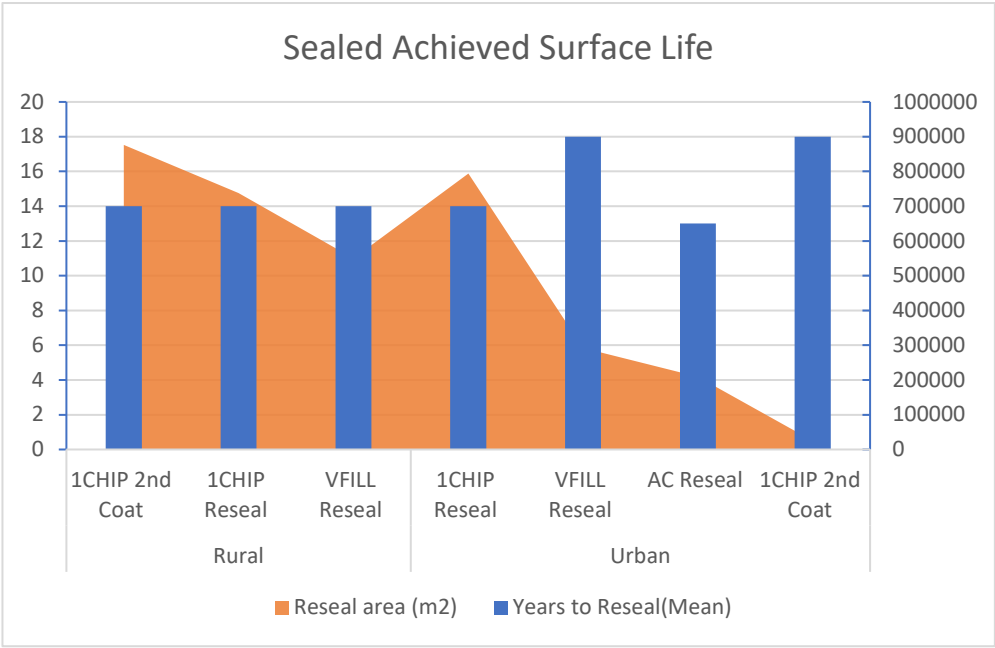
Masterton has a 10-year average resurfacing length of 4.7% of the total network length. To address some of the aging surfaces, a more effective programme might be to aim for resurfacing of around 6% of the network's length annually (see Figure 12: Resurfacing History in metres), with a priority on arterial, primary and secondary collector roads.

Figure 11: Resurfacing History in metres



The achieved surface life in Masterton is shown in Figure 12: Resurfacing History in metres below. On average, we are resurfacing in rural areas every 14 years and in urban areas every 15 years. For reseals, the typical design life for traffic volumes between 500-2000 vehicles is between 10 and 12 years (Chip sealing in New Zealand, 2005). The evidence suggests Masterton is extending the surface life of roads a little too far for those carrying higher volumes of traffic, in particular where the is an increase in heavy traffic.

Figure 12: Sealed Achieved Surface Life



There appears to be an unbalanced maintenance spend on low volume roads caused by heavy traffic volumes in certain areas, $46 low volume vs $5 secondary collector demonstrated in Figure 13 below. This is partly due to higher roading costs spends on low volume roads associated with forestry activity and is 30% of the network.

Figure 13: The overall cost of routine pavement maintenance network VKT for each classification 2018/19

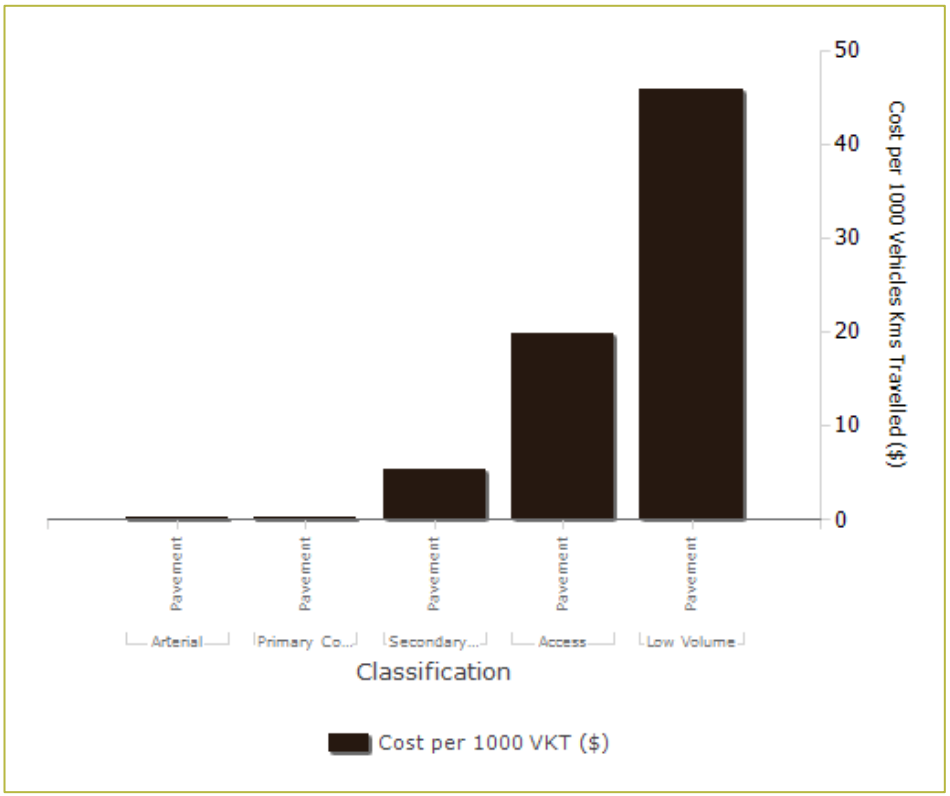
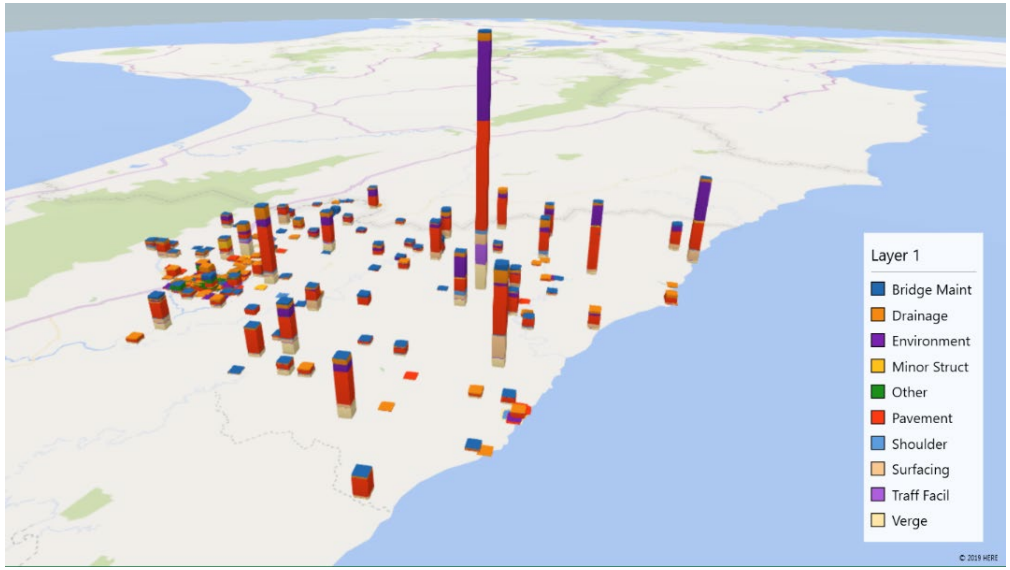


Figure 14: Maintenance Expenditure Locations, demonstrates the last 10 years maintenance budget expenditure by road. The tall towers show where the maintenance spend is the highest, nearly all these towers fall on key forestry routes: Masterton Castlepoint Rd, Homewood Rd, Tinui Valley Rd, and Te Ore Ore Bideford Rd.

Figure 14: Maintenance Expenditure Locations



To keep our network resilient, Masterton will need to continue to invest in the right work at the right time. The four routine maintenance issues listed below, when addressed through an effective maintenance programme, can help to build resilience within the network:

1. The sealed network requires resealing as the seal wears out causing loss of traction, increasing the likelihood of accidents and further pavement deterioration.
2. Metal loss from unsealed roads creates unsafe situations for road users and exposes the road base to more rapid deterioration.
3. Shoulders, drains and drainage appliances lose their effectiveness over time due to vegetation growth, silt, scour etc. thus putting the network at risk from high rainfall events. This increases the risk of interruption of transport services and potentially an increasing cost to the businesses in the area by lowering productivity;
4. Lighting, line marking, and signs deteriorate over time increasing the accident risk to road users if they are absent.

However, if the network deteriorates further and key work is not completed at key times, these issues are exacerbated which will result in expensive repairs. Therefore, investment in these key four areas will improve the resilience of the Masterton network and will be further discussed in the programme business case section.

Also, important to note is that our district has been fortunate in recent years by not experiencing a significant weather event for some time. As a result of this, there has not been an increasing number of road closures. However, the amount of unplanned maintenance is increasing, thus leaving our network vulnerable to severe weather events if and when they occur.

Consequences

- Instances of local roads failing prematurely on known logging agricultural routes, such as Masterton Castlepoint Road and Te Ore Ore/Biddeford Road.
- Deteriorating roads have a high potential to make roads more dangerous. Budgets will need to be reallocated to address the increasing amounts of reactive works in order to make routes safe. This then affects planned work and maintenance, resulting in re prioritisation of programmed work. This subsequently affects the ability of our limited contracting resources to meet deliverables and undertake work.
- There will be a reduction in the level of service delivered to the community and a potential increase in complaints, as their expectations are unable to be met.
- Over time, a deteriorating road network will become expensive to remediate, less resilient and a burden to future generations.

Benefits

- An affordable network which is economically sustainable and fit for purpose with improved economic performance and benefits to the community through travel time, fuel efficiency and vehicle operating costs.
- A level of service that is satisfactory to the community, with a reduction in complaints.
- Reduction in the amount of reactive maintenance spend through reduced incidents of reactive work. This can be demonstrated through the extensive strengthening work that has been carried out on Stronvar Road vs the Masterton Castlepoint Road (no major strengthening work), and the significant difference in maintenance spend between these two roads.
- Roads are safer for everyone and more resilient.

How we will measure success

- Improved resilience with less road closures and a reduction in reactive maintenance (programmed works completed vs actual works).
- Reduction in network costs by work category when compared against peer groups. (PMRT cost efficiency).

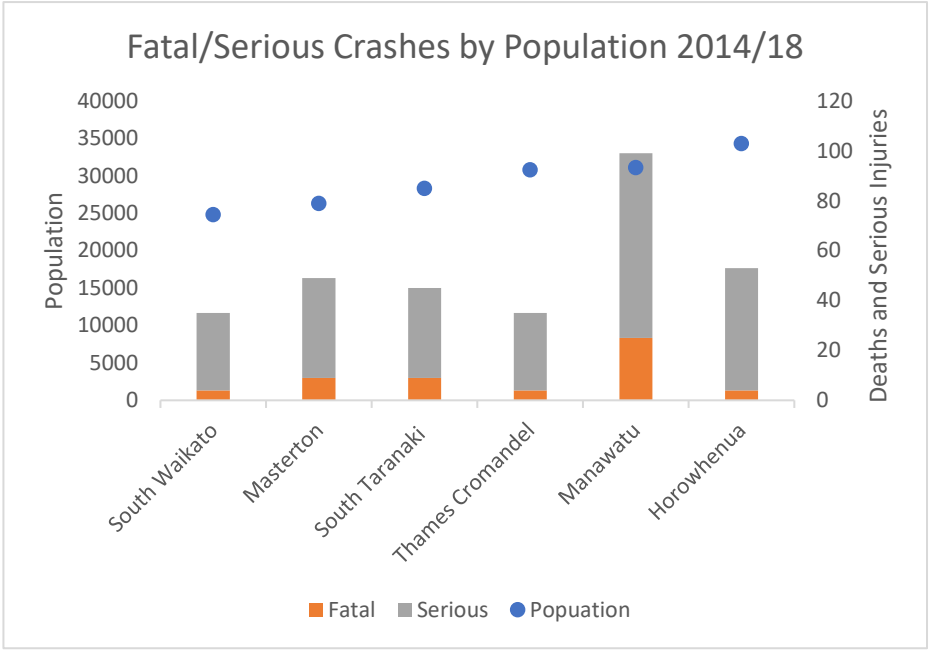
- Target cost vs actual cost.
- A reduction in community complaints as the level of service expectations are met and understood.
- Reduction in serious crashes and an increase in network condition scoring.
- The average surface life on collector roads and haulage routes is reducing.
- The pavement and condition index are improving over time

2.5.2. PROBLEM 2: SAFETY

Define the Problem

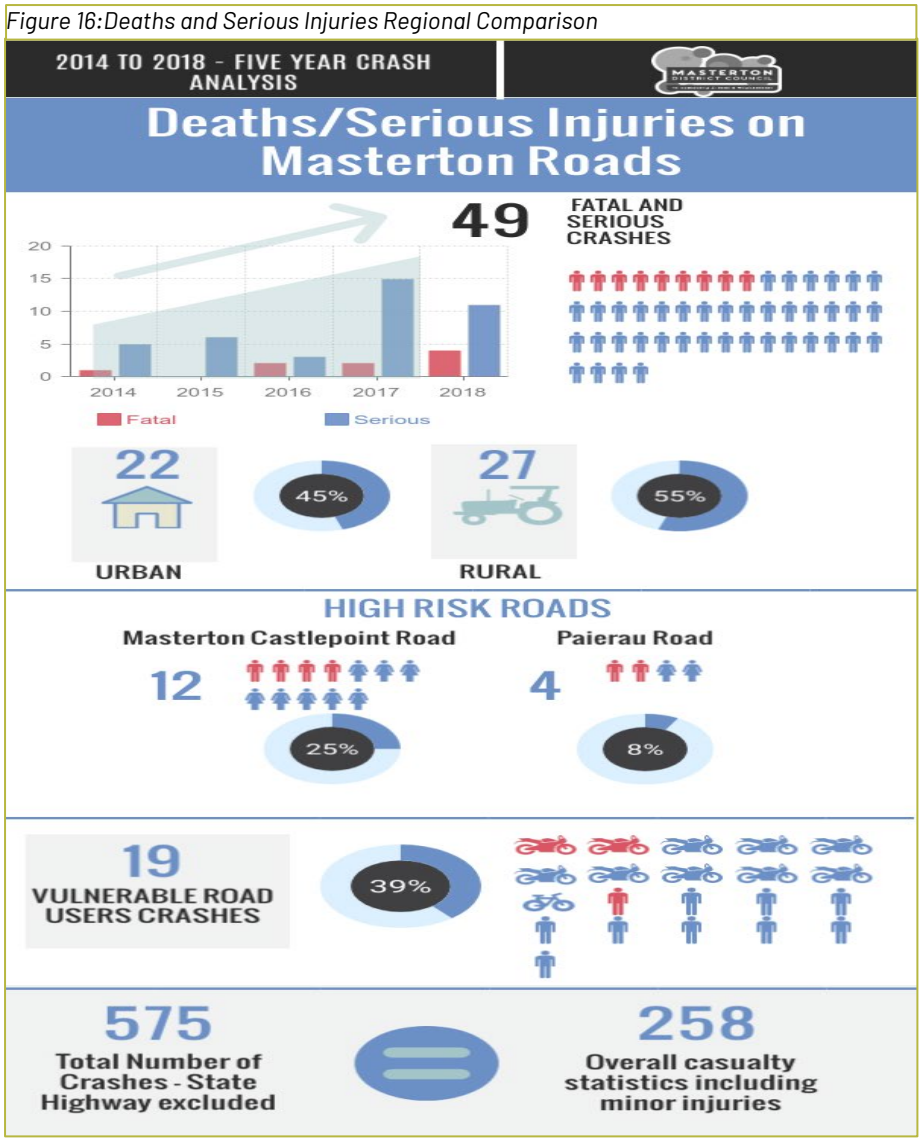
Statement: A range of factors such as challenging rural topography, narrow roads, urban intersection layout, vulnerable users, speed, age and the capability and experience of drivers is resulting in death and serious injuries.	
CAUSE(S)	• Speed within an unforgiving road corridor with limited engineered safety measures • Wide urban roads and narrow, windy rural roads • Poor intersection form at certain locations • Lack of active multimodal infrastructure
EFFECT	• Fatal and serious injury crashes are trending upwards within our region and are high when compared to other districts. There is an increasing trend in personal risk and our community is over-represented in terms of road safety risk when compared against other local authority areas.
CONSEQUENCE	• An unpredictable, unforgiving road network where mistakes cost people their lives. A continuing increasing trend of fatal and serious injury, significantly impacting on the local community.

Figure 15: Deaths and Serious Injuries Regional Comparison



Masterton has more crashes per vehicle kilometre travelled on local roads than many other regions with similar populations. Over the five-year period between 2014 and 2018 there were 49 DSIs on the district's roads. The highest number occurring within this time frame was 17 in 2017 with the lowest being 6 in 2016, see Figure 15 below.

Figure 16:Deaths and Serious Injuries Regional Comparison



When compared with similar sized districts Masterton road safety performance has been poor. There has been an increasing trend in fatal and serious crashes on our roads. To improve our networks safety performance, we need to significantly invest and plan safety interventions on our rural, high risk roads (such as Masterton Castlepoint Road), and invest in multimodal infrastructure to improve outcomes for our vulnerable road users.

There is a heavy reliance of vehicles in Masterton, with a very few residents using bicycles as a form of transport or choosing to walk to close destinations instead of driving.

There appears to be an unsafe attitude towards speed and alcohol. Having a safe network for all users is key to a successful economic, social and cultural wellbeing and the national goal of 'Vison Zero'; a 40% reduction of deaths and serious injuries on New Zealand roads by 2030.

The Communities at Risk Register has been developed by the Transport Agency 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 communities by local authority area, based on the Safer Journeys areas of concern.

The Communities at Risk Register highlights personal risk to road users. Alongside these personal risk calculations are the average annual death and serious injury (DSI) counts based on the latest five-year data (the collective risk at a local body level, regional level and national level) from the Transport Agency's Crash Analysis System (CAS).

Table 3 below highlights in red the areas where our community road users are over-represented in terms of road safety risk.

Table 3: 2019 Masterton Communities at Risk Register

AREA	RANKING WITHIN NZ COUNCILS	RISK
All deaths and serious casualties	8	High Concern
Young drivers (of light vehicles aged 16 – 24 yrs.)	32	
Alcohol and/or drugs	25	
Speed (too fast for the conditions)	2	High Concern
Urban intersections	41	
Rural intersections	28	
All intersections	28	
Rural road loss of control/or head on >70km/hr.	5	High Concern
Motorcyclist involved	9	High Concern
Cyclist involved	56	
Pedestrian involved	31	
Distraction (attention diverted)	13	Medium Concern
Fatigue	22	
Older road users (aged 75yrs and older)	5	High Concern
Restraints (seatbelt not worn)	3	High Concern

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. It is apparent from these statistics that Masterton has significant work to do to address these areas of deficiencies in safety within our community.

Consequences

- An unpredictable, unforgiving road network where mistakes cost people their lives.
- Travel speeds remain high, and people's behaviours continues to be complacent around what is the safe an appropriate speed on our roading network.
- People continue to lose control on our unforgiving rural roads and make mistakes at intersections where crashes can be avoided through better engineering design.
- The overall district trend of fatal serious injuries continues to increase and remain high. Serious injuries to our most vulnerable road users, such as motorcyclists, cyclists and pedestrians continues to increase.
- The GPS and Road to Zero strategic targets to reduce deaths and serious injuries on our roads by 40 percent over the next decade are not met.

Benefits

- Safe and reliable, a connected network for all.
- Reductions in DSI rates towards Road to Zero targets.
- Engineered improvements in network design which are accommodating of human error.
- The management of safe and appropriate speed relevant to the place and geometric design of the road, allowing people and users of all types of transport choice to feel safe and comfortable.

How we will measure success

- Positive trends developed and reported against target measures.
- Department of Internal Affairs – average number of reported injury crashes decreases.
- Favorable Safety ONRC Performance Measures – peer group comparisons, National Statistical reporting "Communities at Risk".
- Positive public perception of increased safety for all modes of transport and a decrease in deaths and serious and minor injuries from crashes involving vulnerable modes of transport (walking, cycling, motorbikes).

2.5.3. PROBLEM 3: ACCESSIBILITY

Statement: the transport industry is pressuring council to upgrade pavements and bridges to make more routes available to high productivity motor vehicles (HPMV).

The community is dissatisfied with accessibility and standard of our walking and cycling facilities.

CAUSE(S)	• Bridge conditions • Government policy and legislative changes allowing heavier vehicles - 39T to 44T on New Zealand roads. Industry is now requesting further increases to 54T. • Increasing harvesting of forestry blocks, with further increases expected over the next 20 years. • Efficiencies in the movement of freight via heavier vehicles. • Poor quality and unsafe routes for walking and cycling • The shape of MDC urban form is disproportionately favouring vehicle choice over more active options of transport.
EFFECT	• Increased payloads on sections of the network not designed to carry heavy loads causes accelerated damage to bridges and pavements. • Continue to build safe accessible infrastructure that supports and make more active modes of transport attractive.
CONSEQUENCE	• Increase of costs to strengthen bridges and roads to avoid pavement damage or structure failure. • Less routes available for heavier loads. • Reduced options for safe transport choices to encourage people to change the way they travel around Masterton. • Reduced social, environmental, and economic outcomes.

Define the Problem

At present, Masterton has limited routes available to HPMVs and a number of bridges have weight restrictions preventing the routes from reaching into the forestry blocks. This is restricting the routes available to the transport industry. 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.

Increasing the amount of weight HVs can take and routes available in the Masterton district has economic benefits to the transport industry and potentially the community. This is achieved by reducing the number of trips required or opening up unproductive land for industry to utilise. Productivity savings are further realised by reducing transportation costs and the community may also benefit from having strengthened assets that are more resilient.

Improving the quality of active infrastructure and the share of walking and cycling in our district (mode shift) has a critical role to play in improving the wellbeing of our community by shaping a more accessible, safer, and sustainable transport system.

Consequences

- 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.
- Our structures will deteriorate over time leading to further restrictions to freight and increasing risk of bridge or retaining wall failure resulting in safety issues and complete loss of access.
- unattractive access and a precipitation of unsafe routes leads to less recreational activity.
- Reduced ability to deliver on social, environmental, and economic outcomes within Council LTP.

Benefits

- Opening more routes to heavier vehicles can lead to economic benefits for producers, landowners, customers, and our communities. Allowing bigger trucks on our roads reduces the number of truck trips needed to move the same amount of freight and can have environmental benefits.
- Strengthening the bridges and pavements on these routes will increase the life of the structures and pavements and reduce maintenance costs.
- Increasing the share of public transport, walking, and cycling in our district (mode shift) will improve the wellbeing of our community as more people choice active modes of transport over vehicles and feel safe using the network for recreational activities.
- A safer active transport system.
- A more sustainable transport system as more people make fewer vehicle trips.

How we will measure success

- Increased percent of routes and roads open to HPMV.
- Increased productivity in the region.
- Strengthened assets on routes suitable of carrying the increased loads.
- Increased numbers of people walking and cycling
- A more accessible, safer and sustainable transport system

2.5.4. PROBLEM 4: AFFORDABILITY

Statement: affordability: There has been a significant increase in the cost to do the work in combination with completing council priorities for a finite funding pool which is reducing the programme of works and deferring maintenance, renewals and improvements.

CAUSE(S)	• Limited resources (materials and people) are increasing the cost to do the work. • Increasing regulations and the cost of compliance is driving up costs. • Council has limited mechanism to raise funds, other than to increase rates. • There is an increasing need to fund more maintenance and capital works. • COVID19 will have an economic impact on the community's ability to pay for programmes and projects.
EFFECT	• The amount of work able to be achieved with the current funding will decrease. There will be an increase in future expenditure due to deferred maintenance, renewals and improvements.
CONSEQUENCE	• Insufficient investment into roading assets leading to further deterioration and safety issues with a perpetuating backlog of works. Increasing costs to residents to return the network to an acceptable level of service.

Define the Problem

Resources are becoming more expensive and difficult to procure; this is affecting the affordability of work for the community. Recent increases to the schedule of rates within the Maintenance Contract and other recent tenders received, such as the rehabilitation and safety improvement contracts, were 20-30% higher than anticipated. This reduces the amount of work council is able to do within the allocated budgets. Historically, there has been pressure on roading budgets to find efficiencies and use less funding, which has led to a backlog of routine maintenance work.

Large upcoming community projects will put pressure on roading budgets within a limited local funding pool.

The increase in larger capital projects and private developments is placing a high demand on a limited construction resource, therefore increasing the cost of tenders received to construct these projects.

Consequences

The quantum of work that is able to be achieved will decrease and a smaller work programme will only accelerate the problems facing Masterton. This will lead to further deterioration and safety issues and a perpetuating backlog of works.

Benefits

- Planning a work programme that maintains the appropriate level of service and leads to a safer network.
- A fit for purpose programme that is able to reduce the backlog and provide a resilient network without comprising the asset for future generations.

How we will measure success

- Programme achievement against the LTP and NZTA annual return.
- Maintaining Council's level of service standards whilst delivering a proactive programme of works that is balanced and not overly reactive.
- The delivery of a capital and renewal programme of works (at targeted renewal rates) to help prevent our network from further deterioration.

2.6. OVERVIEW STRATEGIC RESPONSE

These strategic responses will be developed further in the Programme Business Case section

STRATEGIC RESPONSE	PROBLEMS			
	Aging and deteriorating network	Safety	Accessibility	Affordability
Programme Adjustment: Alter the amount of work done or remove projects	NO Reduce programmed work in another area to increase pavement work, this will reduce the LOS in other areas and create other problems in the future. Use prioritisation processes across work categories.	YES Increase the amount of safety improvement projects. Other work programmes would subsequently need to be adjusted, which has a level of risk and consequences.	NO This will have a significant consequence on other core programmed work. Affordability will be an issue across other work programmes.	NO Reducing the amount of work will not address problems and will affect work programmes.
Policy: Adjusting the level of service	YES 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.	YES Policy can influence where safety funding is spent and how projects are prioritised. Adopting government targets set in 'Vison Zero' will require further policy and funding in order to be achievable.	YES Increase the weight bridges can carry. Prioritise haulage routes for treatment over other roads this will include low volume unsealed roads. Reduce or decline requests for heavier loads on the sections of the network that are vulnerable. Levies on industry may be investigated in the future.	YES Reducing the LOS which will have a negative effect, particularly on the areas of the community that are directly affected by the policy change. Parts of the network will become vulnerable.

Demand: Managing the use of the asset up or down	NO Routes are defined - no way to manage demand.	NO There could be benefits from the separation of vulnerable active modes of transport, however, this is costly and difficult and requires trade-offs in road space.	NO Routes are defined and determined by where forestry plantations are - no way to manage demand.	NO Not applicable.
Funding: Increase/decrease the amount of dollars	YES Increasing funding will allow an accelerated programme of work to reduce the age of the network and address deteriorated sections.	YES Further funding will increase the programme of safety work.	YES Increased funding to strengthen pavements and bridges and increase the number of safe walking and cycling options.	YES Increasing funding to address the increasing of cost and competition for resources.
Risk: Hold assets longer	YES Road surfaces are already older than peer groups with detrimental effects showing.	NO Known significant safety issues need to be addressed without delay. Improvements are required to meet government policy.	NO Not acceptable as safety risk to community is too great.	YES Placing some projects on hold may allow time for the markets to change, but this has significant risk. A dollar today is worth more than a dollar tomorrow, therefore placing the affordability of future projects at risk.

3. LEVELS OF SERVICE

3.1. INTRODUCTION

This AM Plan intends to match the level of service the asset provides with the expectations of customers given financial, technical and legislative constraints. Asset management plans can be readily co-ordinated with strategic financial planning. Allied to which, adoption of formalised asset management systems and practices will provide the council with key benefits which, though acknowledged as understood in broad terms, are repeated here in detail:

- Improved understanding of service level options and requirements.
- Minimum life cycle (long term) costs for an agreed level of service.
- Better understanding and forecasting of asset related management options and costs.
- Managed risk of asset failure.
- Improved decision making based on costs and benefits of alternatives.
- Clear justification for forward works programmes and funding requirements.
- Improved accountability over the use of public resources.
- Improved customer satisfaction and organisation image.

The pursuit of formal asset management planning will enable the council as owner of a comprehensive range of assets to demonstrate to their customers and other stakeholders that services required to be provided are in fact being delivered in the most effective manner.

The purpose of this document is to report on the service levels currently being provided for the range of significant assets the council operates on the community's behalf. Further consideration of options will follow to vary the level of service reported therein, ultimately resulting in the presentation of a series of possible options for future maintenance or improvement. The following information was provided:

- A service statement - a short definitive statement about why the activity is undertaken.
- How we provide the service - the principal means by which we achieve the provision of the service.
- Service standards - the levels of service the customer can expect.
- Response standards - the type and level of response that can be expected from a request for service.
- How we measure our performance - the methods used within each key service area.
- How much the service costs - the net operating and capital costs and rates requirements for each activity.

3.2. CUSTOMER RESEARCH AND EXPECTATIONS

Council's knowledge of customer expectations is based on:

- levels of service consultation
- community outcomes consultation
- annual residents' survey
- public meetings on specific projects
- consultation via Annual Plan process

- feedback from the elected members
- analysis of customer service requests and complaint.

3.2.1. COMMUNITY SURVEY RESULTS

The council conducts a residents' survey to gain feedback on community perceptions of Masterton District Council. The National Research Bureau (NRB) has carried out Communitrak Surveys for the council from 1993 to 2018. This is a means of measuring the council's effectiveness in representing the wishes and viewpoints of their residents. It provides a comparison for the council on major issues, on their performance relative to the performance of their peer group. It also compares the council to local authorities on average throughout New Zealand and to previous Communitrak results, where applicable.

The most recent survey was done in 2020. The satisfaction levels are trend down for roading and this needs to be assessed as Masterton District Council used a new survey provider. Past performance based on recent survey results and compared to national and peer group averages is assessed as being adequate for the level of service desired by the community

The following tables show results of the Key research surveys rating the level of service for roads, footpaths, and parking in May 2020.

Roads and footpaths, the availability of parking in the district has the highest proportion of satisfied residents (48 per cent). Urban residents (49 per cent) are more likely to be satisfied with roads throughout the district than rural residents (45 per cent) – See appendix 10.1.12 for previous survey results.

Table 3.1 Customer survey results 2020

SERVICE	Satisfied (7-10)	Area	
		Urban	Rural
Overall roading and footpaths	48%	49%	45%
Availability of parking in the district	62%	61%	66%
Cycling in the district	45%	45%	46%
Street lighting throughout the district	55%	54%	61%
Roads throughout the district	55%	58%	45%
Ease of moving around the district at peak times	45%	45%	44%
Footpaths throughout the district	41%	40%	46%

Notes:

Sample: n=562; Urban n=398, Rural n=167; Excludes Don't knows

How satisfied are you with each of the following council services?

Everything considered, how satisfied are you with the roading-related infrastructure and how this is maintained?

Table 3.2 Customer comments: survey results 2020

RESIDENT COMMENTS SURVEY 2020	PERCENTAGE OF CUSTOMERS
Footpaths are in bad condition	25%
Roads are in poor condition, need maintenance - potholes, bumpy, bad surfaces etc	21%

RESIDENT COMMENTS SURVEY 2020	PERCENTAGE OF CUSTOMERS
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%
Happy with everything	8%
Not enough car parks	5%
Gravel roads/rural roads need more regular grading and maintenance	4%
Other	2%

Notes: Sample: n=349; Excludes Don't knows and No comments

3.2.2. LEVEL OF SERVICE CONSULTATION

The council's levels of service contribute to achieving the following community outcomes as listed below. The Community Outcomes were originally identified as part of the 2006-16 LTCCP process and were widely consulted on at that time. For more information re the consultation process please refer to 'Shaping Our Future Volume 1: Community Outcomes 2006-16'.

3.3. STRATEGIC NEEDS AND CORPORATE GOALS

3.3.1. PHYSICAL INFRASTRUCTURE

The provision of physical infrastructure provides an important foundation for the role the council performs in economic and community development. The council is therefore committed to its role as manager of the range of valuable and essential assets deemed core services.

Core services are those services provided by the council to ensure the physical and economic health and wealth of the community. They include the provision of a safe and efficient roading network.

A key task is to put in place long term plans for maintaining and upgrading, when necessary, the roading asset to meet future demand along with management plans to ensure the assets are maintained in perpetuity.

This will allow the council to prepare a realistic long term capital programme which will enable it to prioritise the work and to smooth out rates increases caused by capital works. It will also ensure services are reviewed and upgraded when required rather than waiting until they are overloaded.

As manager of the roading asset, the council has the responsibility to ensure the asset management plans are co-ordinated with strategic financial planning.

3.3.2. SUSTAINABILITY

The Local Government Act 2002 (schedule 10b) states that a purpose of local government is to promote the social, cultural, economic and environmental well-being of its communities, now and for the future. This statement captures and is consistent with, concepts of sustainable resource management and sustainable development.

Masterton District Council understands and is committed to, its role as a guardian of community assets. The council's decision-making processes are structured to ensure a sustainable approach to asset and resource

management. The council realises the importance of considering our community's needs right now, as well as the long-term benefits, impacts and costs of any decisions made.

The council aims to at least maintain the quality of life, environment, and community that exist today. Where affordable improvements can be achieved, short or long term, for current and/or future generations, these will be pursued.

At a base level, the commitments outlined in Table 3.3 will guide the council decision making in relation to pursuing and achieving objectives of sustainable management and development in relation to roading assets.

Table 3.3 Council Decision Making Guidelines for Sustainable Development

COUNCIL DECISION MAKING GUIDELINES FOR SUSTAINABLE DEVELOPMENT	
Social	Community development initiatives will be supported. Opportunities for community activities and events will be promoted. Standards to support health and well-being will be maintained. Social needs will be considered in all infrastructural planning.
Cultural	The perspectives and cultural needs of all members of its community will be considered when making decisions, particularly those of local Iwi. Community activities and initiatives to promote and celebrate diversity will be encouraged. Arts, culture and heritage initiatives are recognized as being the 'heart' of our community and will be encouraged.
Economic	Depreciation will be funded as appropriate to each asset, considering the asset's strategic value, anticipated future of the asset and expectations for the availability of funding for replacement or renewal. Funding policies will include an intergenerational equity clause. Energy efficiency cost savings will be pursued where feasible. Initiatives to attract and retain skilled residents will be supported and promoted. Affordability will be a key consideration in all decisions made. Costs of all activities will be shared across the life of the asset.

Environmental	Initiatives to protect and/or enhance our natural environment will be supported. Actions consistent with the objectives of the Wairarapa Combined District Plan and the Wellington Regional Policy Statement regarding sustainability will be pursued. Opportunities to be more energy efficient and to minimise our carbon footprint will be sought. The potential impacts of climate change will be considered and actions to mitigate and/or adapt supported.

3.3.3. LEVEL OF SERVICE STATEMENTS

Roads and urban streets are provided at a quality acceptable to the community and are maintained to the nationally accepted standards.

Adequate bridges, culverts, surface water channels, streetlights (in urban areas), signage and markings are provided to ensure an efficient and accessible roading network.

Urban streets and verges are clean and street furniture is in a usable condition.

Roads and bridges are provided to a standard that results in an acceptable level of safety on the roading network for all road users.

Footpaths are safe, accessible and efficient for pedestrians.

Tables 3.4 and 3.5 shows how the levels of service identified for the roading assets contribute to the community outcomes identified by our community and the activity goals Masterton District Council are aiming to achieve.

Table 3.4 Service Levels - Community Outcomes

SERVICE LEVELS - COMMUNITY OUTCOMES					
Levels of Service	A Strong Resilient Economy	A Sustainable, Healthy Environment	An Active, Involved and Caring Community	A Knowledgeable Community	An Easy Place to Move Around
This level of service:	Aims to ensure the needs of local communities are met regarding the provision of transport access requirements. This contributes to both the community's capacity for growth and economic development, now and in the future.				
Provide and maintain rural sealed and unsealed roads and urban streets	√	√	√		√
Adequate bridges, culverts, lighting etc. for an efficient and accessible roading network	√	√	√		√
Urban streets and verges are clean and street furniture is in a usable condition	√	√	√		√
The roading network is safe for all road users	√	√	√		√
Footpaths that are safe, accessible and efficient for pedestrians	√	√	√		√
This level of service:	Aims to ensure that services are provided in a way that is equitable, whilst maximising public opportunities and minimising environmental impact.				
Provide roading services in a manner that is acceptable, safe and has minimal environmental impact	√	√		√	√

Table 3.5 Roading Activity Goals

ROADING ACTIVITY GOALS	
Community Outcome	How Roading Assets Contribute
A Sustainable, Healthy Environment	Roading services are provided in a manner that minimises environmental impact. Provision of footpaths and cycle routes also promote 'alternative' transport options.
An Engaged and Empowered Community	Contributing to road safety education through supporting the Wairarapa Road Safety Council.
Pride in Our Identity and Heritage	Providing a roading network to enable people to move around the district is critical to social wellbeing for a range of reasons, including enabling people to socialise, attend public meetings and events, go to work, school, medical appointments etc. Providing footpaths and cycle routes helps to promote opportunities for physical activity Road safety activities contribute to the safe use of roading networks. Providing for people with disabilities and those using mobility scooters to move safely throughout the community and connect people with the community.
Efficient and Effective Infrastructure	Providing, managing and maintaining a roading network enables people to move around the district and to neighbouring districts. Road safety initiatives help to promote safe use of these networks.
A Thriving and Resilient Economy	Roading services are essential for many businesses, commercial industries and for tourism. Roading services are an essential element in any plans to grow and/or develop the district. People need to be able to access and move within the district as well as being able to access neighbouring areas.

3.3.4. NON-FINANCIAL PERFORMANCE MEASURE RULES

Following public consultation, the DIA finalised these rules. They come into force on 30 July 2014 and local authorities are required to incorporate the performance measures in the development of their new 2015-25 long-term plans. The performance measures were reported against for the first time in the 2015-16 Annual Report and each year after. The latest report is the MDC Annual Report 2019-20.

For roading these were split into five measures: road safety, road condition, road maintenance, footpaths, and response to service requests. Table 4: Levels of Service expands on these measures.

3.3.5. LEGISLATION

Statutory requirements set the framework for the minimum standards of service which the roading assets must meet and are generally non-negotiable.

3.3.6. BYLAWS AND POLICY

District Bylaws set limits around permissible activities.

3.3.7. DISTRICT AND REGIONAL PLANS

This document determines land use and levels of consultation required to undertake certain kinds of work.

The Wairarapa Combined District Plan classifies the Council roading network using the following hierarchy:

Strategic Arterial: Road which forms part of the network of nationally or regionally important arterial routes that predominantly carries through traffic and the major traffic movements in and out of the district.

District Arterial: A road which caters for traffic movement within or between major areas of the district and as alternative routes to neighbouring territorial authorities.

Collector: Locally preferred routes forming a link between the arterial roads and residential, commercial, industrial, and recreational areas. Although having a major through traffic carrying function, they also serve adjacent property.

Local: Roads with the main function of providing access to adjacent properties.

3.3.8. RESOURCE CONSENTS

The resource Management Act requires Council to:

- sustain the potential of natural and physical resources to meet the reasonably 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 take into account the principles of the Treaty of Waitangi in the management of roading infrastructural assets.

3.4. CURRENT LEVEL OF SERVICE

Current customers and stakeholders for Council's roading assets are listed below:

Customers: Ratepayers, residents, businesspeople, local industries, forestry owners, Road Transport Forum, Heavy Haulage Association, AA Wairarapa, Destination Wairarapa, Tranzit Coach lines, Federated Farmers, cycle groups, educational institutions, emergency services.

Stakeholders: Ministry of Transport, Waka Kotahi/Agency (formerly NZTA), neighbouring local authorities, NZ Police, Greater Wellington Regional Council, contractors, subdivision developers.

3.4.1. CUSTOMER LEVELS OF SERVICE

The adopted levels of service for roading reflect current industry standards and are based on:

Customer Research and Expectations: Information gained from the community on expected quality and services.

Legislative Requirements: Environmental standards, regulations and acts that impact on the way assets are managed i.e. resource consents, building regulations, health and safety legislation, Transport NZ Act, Local Government Act 2002, Land Transport Management Act 2003.

Strategic and Corporate Goals: Provide guidelines for the scope of current and future services offered the manner of service delivery and define specific levels of service which the organization wishes to achieve.

3.4.2. PERFORMANCE MEASURES

Table 4: Levels of Service summarises the levels of service and performance measures. The light blue shaded rows show those that are included in the long-term plan and reported in the annual plan. The light purple shaded rows are technical measures that are only included in the activity management plan

The performance indicators, targets and results reported below are designed to give an indication of how the council is progressing towards achieving the community outcomes listed.

Table 4: Levels of Service

GPS / OUR GOAL	MEASURE	LATEST RESULT 2019-20 (BASELINE)	PERFORMANCE TARGETS 2021-22 TO 2030-31
Safety Value for Money Amenity	The number of fatalities and serious injury crashes on the local road network • Mandatory Measure 1 • Measured using the NZ Transport Agency's crash database	1 fatality 9 serious injury crashes	Reduction in number of fatalities from previous year Reduction in number of serious injury crashes from previous year
Meeting our commitment to delivering safe, well- maintained roads and footpaths that meet the needs of our community	Average quality of ride on a sealed local road network, measured by smooth travel exposure. Smooth travel exposure is defined as the proportion of vehicle kilometers travelled on roads with roughness below the following thresholds: • Mandatory Measure 2 • Measured by traffic counts and biennial roughness survey (last Competed 2018 next due 2020) and reported through RAMM	**Average 95% Network** Arterial 86.9% Primary Collector 93% Secondary Collector 98.9% Access 98.9% Access LV 95.7%	Avg-Maintain or improve on 90% Arterial -90% Primary Collector - 90% Secondary Collector – 90% Access – 85% Access LV - >85%
	Percentage of sealed local road network that is resurfaced • Mandatory Measure 3	6.5%	Maintain within 5-7%
	Percentage of footpaths in Masterton District that are maintained to a condition of Average or better. • Mandatory Measure 4	94%	97% of footpaths are rated Excellent, Good or Fair
	Percentage of urgent customer service requests responded to within 2 days • Mandatory Measure 5	99.7%	95% within specified timeframe
	Percentage of non-urgent customer service requests relating to the transportation responded to on time. • Mandatory Measure 5 • As measured by the maintenance contractor's compliance with fault response times requirements (using RAMM) and the percentage of requests assigned to Council staff which are attended to within 5 days (using NCS).	69%	80% within specified timeframe

GPS / OUR GOAL	MEASURE	LATEST RESULT 2019-20 (BASELINE)	PERFORMANCE TARGETS 2021-22 TO 2030-31
	Why this is important: These measures have been developed by the Department of Internal Affairs and all councils must report on these. They reflect a range of information about our asset condition and responsiveness to service requests that assists us in managing these assets and our service delivery. They also enable us to benchmark against other councils.		
Accessibility Increasing cycling as a mode of transport	Number of cyclists using our urban roading network • Measured using day traffic surveys in October / November	164 counted during the annual survey in November 2019	Increase on previous year
	Why this is important: An increase in the number of people cycling will contribute to social development through improving the health of our people and environmental development by reducing carbon emissions. We aim to provide facilities that will encourage more people to cycle. This measure tells us if our approach is working.		
Value for Money Our transportation network is maintained cost effectively and whole of life costs are optimised	Council maintains the Condition Index (CI) for sealed roads within the specified range. • As reported through RAMM. CI is a measure of visual defects identified during Condition Rating inspections completed biennially. The lower the CI, the better the condition.	2018-21: 94 % of the network has an SCI value <= 8.	90% of the network <= 8
	Council maintains the Pavement Integrity Index (PII) within the specified range. • As reported through RAMM. PII combines surface faults (CI) with structural defects rutting roughness and shoving. The lower the PII, the better the condition.	2020/21: 92% of the network has a PII <= 8.	90% of the network <= 8
	Council maintains a sustainable average sealed surface age and maximises the whole of life cost of the surface. • As reported through RAMM.	2018-20: 84% of the network length has a surface age <=16 years.	80% of the surface age <16 years

GPS / OUR GOAL	MEASURE	LATEST RESULT 2019-20 (BASELINE)	PERFORMANCE TARGETS 2021-22 TO 2030-31
Amenity The travel quality and aesthetics of our transportation network is managed at a level appropriate to the importance of the road and footpaths and satisfies the community's expectations	The average ride (85th percentile) comfort level of the sealed road network meets specified levels. • As measured by biennial Roughness survey (last completed 2018/19, next due 2020/21) and reported through RAMM.	New Measure Arterial - 120 Primary Collector - 88 Secondary Collector – 92 Access – 102 Access LV - 133	**NAASRA Value** Arterial - <=100 Primary Collector - <=110 Secondary Collector – <=120 Access – <=120 Access LV - <=140
	Residents are satisfied with Council's roads and footpaths in the District. • As measured through the Key Research survey.	2019/20 Performance (% scoring 7-10) Roads: 55% Footpaths: 41% Cycling in the district: 45%	Maintain or increase satisfaction level.

3.4.3. DETAILS ON THE LEVEL OF SERVICE DESIRED

It should be noted that the level of services provided through upgrading assets is subject to the availability of capital contributions for that service.

3.4.4. FINANCIAL IMPLICATIONS

In 2020-21 Roading Services, delivered at current levels of service, cost: (2020-21 Annual Plan)

Operating Expenditure	$14,223,395
Operating Income	$4,626,578
Rate's contribution:	$8,483,252

The key actions and issues identified in this section requiring attention and/or intervention, and the costs associated with the proposed work, are outlined in Table 3.8

Table 3.8 Cost of Enhancing Current Levels of Service

Cost of Enhancing Current Levels of Service			
Action/Issue	Driver for Action	Estimated Cost	How this will be funded
CBD upgrade (2021-23)	Enhanced customer experience	$3,900,000	Development contribution and loan

Cost of Enhancing Current Levels of Service			
Action/Issue	Driver for Action	Estimated Cost	How this will be funded
			Subsidy where asset is end of life
Urbanisation of developing peri urban Streets	Development	$3,656,000	Development contribution and loan
Cycle lane development	Safer cycling access	$70,000	Rates and subsidy
Cycle strategy implementation	Safer cycling access	Cost to be determined	Rates and subsidy
Mataikona Road	Resilience	Cost to be determined est.$10,000,000	Loan rates and subsidy

Knowledge of customer expectations is based on:

- Levels of Service Consultation
- Community Outcomes consultation
- Annual Residents Survey
- Public meetings on specific projects
- Consultation via Annual Plan process
- Feedback from the elected members and community boards
- Analysis of customer service requests and complaints

4. FUTURE GROWTH AND DEMAND

4.1. INTRODUCTION

Growth is a critical demand driver of service provision. As such, the district must not only account for the lifecycle cost of its existing asset portfolio, but also those of any anticipated capital projects. 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 growth requirements. A careful examination of growth trends will provide meaningful data that should be considered alongside existing asset funding requirements in the development of an asset investment strategy.

4.1.1. FACTORS INFLUENCING DEMAND

Masterton District Council needs to consider the following factors in order to predict the future demand:

- population
- traffic volume
- traffic mix
- tourism and seasonal factors
- land use
- dairying, forestry
- Continual demand for improvements in levels of service resulting from:
  - advances in available technology
  - improving standards of living
  - a greater understanding of customers' perceptions and expectations
  - a higher level of road safety conscientiousness
  - changing legislative requirements
  - change in the strategic management of assets by the council
  - funding organisations setting higher standards.

Another factor that could influence the transport corridors in particular the rural network will be the use of the network by the 'Wairarapa Water This is a multi-purpose water scheme for Wairarapa to collect and store water then distribute it for a variety of economic and community uses.

Masterton District Council with the project committee and GWRC will work through the installation process of storage and reticulation. The forecasted commencement of decision for the project is currently 2021.

4.1.2. POPULATION STATISTICS

The population of the district increased slightly during the 1980s, rising from about 22,000 in 1981 to about 22,600 in 1991. The population has been relatively stable since however the most recent Stats NZ estimated Population (ERP) June 2019 data does show an increase to 26,800 *(id community profiles)*.

The 2018 census information gives us the following information.

Seventy-eight (78%) per cent of the population lives in the urban area of Masterton. (NB: census boundary changes for 2018 – SSGA18)

Those identifying as Maori ethnic group 21.3 per cent (compared with the Wellington region average of 14.3 per cent) and 84.7 per cent identifying as European (WLG Reg 74.6 per cent) NB: Multi – responses possible. Masterton also had increases from the 2013 census in Pacific and Asian communities but are still very low compared to Wellington Region and the rest of NZ.

Overall, 24.5 per cent of the population was aged between 0 and 17, and 27.9 per cent were aged 60 years and over. Both have increased in percentages since 2013.

The overall population showed virtually no change between the 1996 and 2006 Census, as Table 4.2 shows. However, there was a small increase of approximately 700 people between the 2006 and 2013 Census'.

Whilst the demographic profile of the population is changing (e.g. ageing, a higher proportion of Maori and more diversity), the overall population is likely to increase at 1 per cent. Statistics New Zealand 2018 projections are consistent with this, see Figure 4.1 & Figure 4.2 shows projections by age group and illustrates an ageing population.

Table 4.1 Masterton District Population 2001-2019*

MASTERTON DISTRICT POPULATION 1996-2016*					
Area	2001 Census	2006 Census	2013 Census	2018 Census	2019 June Est*
Urban	17,793	17,667	18,129	20,103	21,172*
Rural	4,824	4,956	5,223	5,554	5628*
Total	22,617	22,623	23,352	25,557	26,800*

Sub-district Population

The district level population projections are distributed into sub-district areas in consideration of the how the existing population is distributed and where future growth is expected to be distributed. Projections are provided for Statistical Area 2 (SA2) areas within each district, with these areas illustrated in maps in Appendix 1.

The distribution of future growth was determined through discussions with council staff and consideration of the district plan. Consideration was given to the historic distribution of growth, future availability of suitable land (zoned and otherwise). The Regional Growth Framework was not explicitly included given its draft status; however, the projections are broadly compatible as they feature a clustering of development around existing urban nodes, particularly railway stations. This is because of investment in the Wairarapa Line which is likely to increase patronage, and the Regional Growth

Framework's emphasis on development along public transport corridors.

In Masterton District, the majority of population growth is expected to take place in the Masterton urban area, with urban expansion on the North and West fringes and light intensification around railway stations and in Masterton Central. The strongest growth is expected to take place in Upper Plain (population increase of 1,265 over 2019-2051), Opaki (1,336), Lansdowne West (1,001), and Lansdowne East (502). Moderate growth is expected in Solway North (213), Solway South (363) and Ngaumutawa (330).

Ngaumutawa growth is expected to take place in the near term as the last greenfield land in the area is developed. Small population declines are projected in McJorrow Park, Whareama, and Cameron and Soldiers Park, however it is important to note that this is due to a decreasing household size rather than a decrease in the number of households.

Table 4.1a Masterton District Sub-District Population

Infometrics medium projection

Statistical Area 2	2019	2051	Change 2019-51
Opaki	1,224	2,560	1,336
Upper Plain	1,316	2,581	1,265
Lansdowne West	1,681	2,682	1,001
Lansdowne East	2,875	3,377	502
Solway South	3,604	3,967	363
Ngaumutawa	1,626	1,956	330
Solway North	2,438	2,650	213
Douglas Park	2,082	2,188	106
Kuripuni	1,711	1,786	75
Masterton Central	741	800	59
Kopuaranga	966	1,015	49
Homebush-Te Ore Ore	1,090	1,138	48
Cameron and Soldiers Park	2,256	2,212	-44
Whareama	1,464	1,375	-89
McJorrow Park	1,726	1,405	-321
Masterton District Total	**26,800**	**31,692**	**4,892**

Table 4.1b Masterton District Sub-District Households

Infometrics medium projection

Statistical Area 2	2019	2051	Change 2019-51
Opaki	526	1,107	581
Upper Plain	539	1,121	582
Lansdowne West	695	1,144	450
Lansdowne East	1,221	1,436	214
Solway South	1,396	1.646	250
Ngaumutawa	689	846	157
Solway North	971	1,108	137
Douglas Park	840	918	78
Kuripuni	710	783	73
Masterton Central	301	378	77
Kopuaranga	394	466	73
Homebush-Te Ore Ore	460	504	44
Cameron and Soldiers Park	925	943	18
Whareama	589	614	25
McJorrow Park	589	586	-2
Masterton District Total	**26,800**	**31,692**	**4,892**

Table 4.2 Population and age structure at the 2018 census of Masterton District

AGE STRUCTURE - SERVICE AGE GROUPS							
Masterton District - Total persons	2018			2013			Change
Service age group (years)	Number	%	Wellington Region %	Number	%	Wellington Region %	2013 to 2018
Babies and Pre-schoolers (0 to 4)	1,590	6.2	5.9	1,452	6.2	6.7	+138
Primary Schoolers (5 to 11)	2,364	9.3	9.0	2,205	9.4	9.0	+159
Secondary Schoolers (12 to 17)	2,079	8.1	7.3	2,073	8.9	7.8	+6
Tertiary education and independence (18 to 24)	1,830	7.2	10.2	1,716	7.3	10.6	+114
Young workforce (25 to 34)	2,751	10.8	14.5	2,220	9.5	13.1	+531
Parents and homebuilders (35 to 49)	4,377	17.1	20.4	4,254	18.2	21.7	+123
Older workers and pre-retirees (50 to 59)	3,444	13.5	13.1	3,417	14.6	12.9	+27
Empty nesters and retirees (60 to 69)	3,384	13.2	9.8	2,856	12.2	9.5	+528
Seniors (70 to 84)	3,054	12.0	8.0	2,544	10.9	7.3	+510
Elderly aged (85 and over)	681	2.7	1.7	618	2.6	1.6	+63
Total population	25,554	100.0	100.0	23,355	100.0	100.0	+2,199

Data has indicated a small but consistent increase in the rural population over time, which may reflect development in areas like Opaki. However, with an ageing population and increased transport costs, this trend may reverse as more people choose to reside in the urban area closer to facilities.

4.1.3. GROWTH V DEMAND

Although Growth and Demand are considered together in this section, it is worth noting that they do have different implications regarding the on-going function/delivery of the activity.

Growth in relation to the transportation activity mainly refers to the growth/changes in population or areas that are growing due to new residential developments. These changes can affect pedestrian movements, traffic flows due to commuting, increase in heavy commercial vehicles due to increased demand for goods and services etc. This essentially leads to an increase in the volume of traffic on the network and changes in way people move around our transport network.

Demand for services can be influenced by growth, alternative modes of transport, type of developments (e.g. commercial/industrial development will generally have greater requirements) and customer expectations and trends, and costs of transport.

4.1.4. URBAN DEVELOPMENT

The Masterton District includes the following census area units:

Rural: Homebush-Te Ore Ore; Opaki, Upper Plain; Kopuaranga; Whareama;

Urban: Masterton Central; Ngaumutawa, Kuripuni; Douglas Park; Soldiers and Cameron; Solway North; Solway South; McJorrow Park; and Lansdowne East and Lansdowne West.

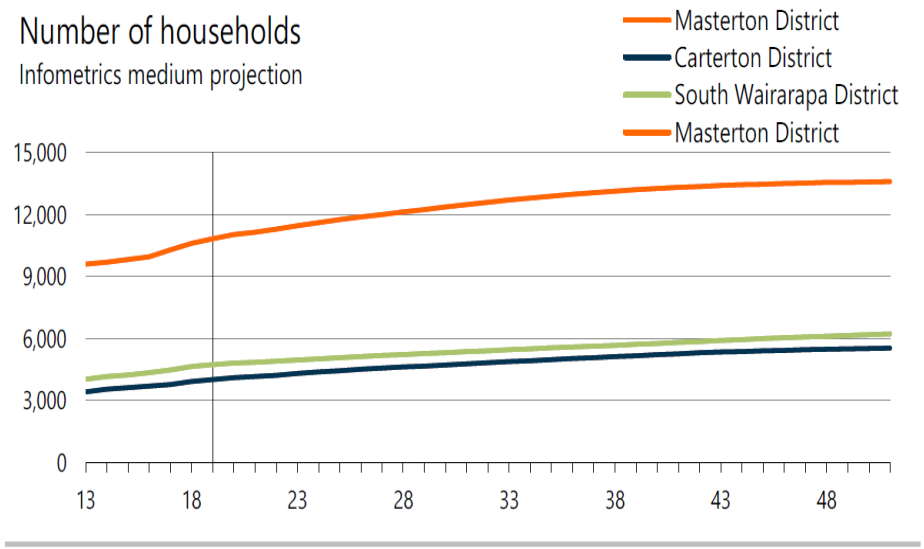
Masterton District's recent growth continues to be one of highest in the Wellington region with the Wairarapa area as a whole outpacing the capital city since 2013. Building consents continue to be strong with 192 issued in 2018 versus 63 issued in 2013. The graph below illustrates Masterton District's recent growth. Most of the population growth is expected to take place in the Masterton urban area, with urban expansion on the north and west fringes and light intensification around railway stations and in central Masterton. The strongest growth is expected to take place in Upper Plain (population increase of 1,265 over 2019-2051), Opaki (1,336), Lansdowne West (1,001), and Lansdowne East (502). Moderate growth is expected in Solway North (213), Solway South (363) and Ngaumutawa (330). Ngaumutawa growth is expected to take place in the near term as the last greenfield land in the area is developed. Small population declines are projected in McJorrow Park, Whareama, and Cameron and Soldiers Park, however it is important to note that this is due to a decreasing household size rather than a decrease in the number of households.

4.1.5. RESIDENTIAL DEVELOPMENT

Residential development forecasts assume the number of dwellings in Masterton District will increase by an average of 86 dwellings per annum to 13,599 in 2051. The addition of dwellings to the housing stock is a major driver of population growth in an area, providing opportunities for households to relocate from other areas or new households to form locally (such as young people leaving the family home or separations/divorces).

Residential development can take various forms depending on the availability of land. These include new housing estates on greenfield sites, subdivision in existing residential neighbourhoods (often called infill development), conversion of industrial lands to residential lands, and densification of housing by building up.

Figure 4.1 Residential development forecasts



The most significant demand on land capacity for urban growth over the next 25 years is expected to come from new residential development. Adequate capacity is considered to exist for commercial and industrial needs within existing zoned areas. therefore, no new zoned areas for these land uses are recommended at this time for the next ten years. The analysis of current vacant and zoned land estimates that there will be a need to provide additional land capacity for the development of up to approximately 800-1,000 residential dwellings in the Masterton urban area by 2051.

Table 4.3 shows population change within these areas. In the rural ward, growth is predominantly north of Masterton's urban area in Kopuaranga and Opaki-Fernridge where subdivision has occurred, and many lifestyle blocks now exist. Within the urban boundary, growth has occurred in Masterton East and Solway (North and South). New housing developments have occurred in these urban areas, for example William Donald Drive, Solway Crescent, Gimson 7 stage development and Norris Way areas. Other subdivisions under way are The Barracks (Solway Nth), Chamberlain Road (Ngaumutawa), and Gordon Street (Lansdowne East).

Table 4.3 Masterton District population forecast by area (SSGA18) – Infometrics Projection August 2020

MASTERTON DISTRICT POPULATION FORECAST BY AREA (SSGA18)														
Area	2013	2018	2019	2020	2021	2022	2023	2024	2025	2030	2035	2040	2045	2051
Masterton District	24,060	26,330	26,800	27,163	27,345	27,606	27,935	28,246	28,529	29,759	30,844	31,498	31,706	31,692
Kopuaranga	880	950	966	978	984	993	1,003	1,012	1,019	1,042	1,049	1,039	1,029	1,015
Upper Plain	1,110	1,270	1,316	1,357	1,390	1,427	1,469	1,525	1,581	1,867	2,151	2,375	2,513	2,581
Opaki	1,045	1,165	1,224	1,279	1,326	1,378	1,434	1,494	1,553	1,846	2,129	2,358	2,496	2,560
Ngaumutawa	1,420	1,545	1,626	1,702	1,768	1,839	1,917	1,941	1,963	2,026	2,023	2,002	1,975	1,956
Solway North	2,200	2,410	2,438	2,455	2,455	2,463	2,476	2,491	2,503	2,563	2,635	2,665	2,662	2,650
Lansdowne West	1,430	1,635	1,681	1,721	1,749	1,783	1,822	1,873	1,923	2,170	2,402	2,557	2,635	2,682
Masterton Central	625	730	741	750	753	758	766	773	780	823	870	866	832	800
Kuripuni	1,695	1,695	1,711	1,720	1,718	1,720	1,726	1,736	1,745	1,780	1,816	1,827	1,811	1,786
Douglas Park	1,955	2,060	2,082	2,095	2,095	2,099	2,109	2,121	2,130	2,163	2,195	2,210	2,204	2,188
Solway South	3,100	3,560	3,604	3,633	3,638	3,653	3,676	3,706	3,731	3,835	3,922	3,969	3,981	3,967
Lansdowne East	2,620	2,810	2,875	2,929	2,964	3,008	3,060	3,095	3,126	3,243	3,308	3,339	3,353	3,377
Cameron & Soldiers Park	2,050	2,240	2,256	2,262	2,253	2,249	2,251	2,256	2,259	2,264	2,282	2,279	2,249	2,212
Whareama	1,305	1,450	1,464	1,472	1,470	1,472	1,477	1,480	1,482	1,463	1,428	1,405	1,390	1,375
Homebush-Te Ore Ore	970	1,085	1,090	1,089	1,082	1,077	1,074	1,076	1,077	1,074	1,083	1,102	1,119	1,138
McJorrow Park	1,655	1,725	1,726	1,720	1,701	1,686	1,676	1,668	1,657	1,599	1,553	1,505	1,457	1,405

4.1.6. POPULATION IMPACT ON TRANSPORTATION

Masterton's 90 per cent of vehicle movements are by light passenger and light commercial vehicles, rather than heavy (freight or passenger) vehicles. This proportion is unlikely to change in the foreseeable future. Population data has a strong correlation with the number of light passenger and light commercial vehicles on the road - crucial in considering impacts like congestion effects. The degree of Masterton's population changes in the future and will lead to transport impacts .

While our roading infrastructure is able to be managed for this current predicted growth the prolonged period of high urban and peri urban growth will require some changes to the way we manage, design and use our roading infrastructure.

The propensity of a person to travel decreases with age after the mid-50s and projections need to take the age structure of future populations into account to make realistic projections. Projections for an aging population made without taking aging into account are likely to produce a substantial overstatement of future travel.

Household travel on Masterton's roads between 2019 and 2051 will increase by around 22 per cent. We also know that older people travel more in urban traffic area than on the open road, which again means that estimates of travel by urban/rural/ state highway/non-state highway that do not take aging into account are likely to be inaccurate.

Highway design efforts will need to respond to the larger proportion of older drivers on the road, whose decreased visual and other sensory capabilities will need to be catered for. This will emerge as a priority to varying degrees around Masterton, depending on the proportions of older drivers in the traffic stream. Pedestrian safety, including pedestrian collisions with motor vehicles and non-motor vehicle related pedestrian injury, will be a special concern in the future, as the projected increase in older people will bring with it a large increase in older pedestrians. Older pedestrians are a particularly vulnerable road user group.

4.2. COMMERCIAL AND INDUSTRIAL DEVELOPMENT

The Commercial Zone is a single zone covering the main business and retail areas in the Masterton urban area. 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), and most recent retail development has been accommodated within this area, with adequate capacity for further development or redevelopment.

Masterton District Council is embarking on a rejuvenation of our town centre. This project will have major impact from growth and demand projections. Existing pavements around CBD will be renewed. It also encourages road safety and promote provide a mode shift from cars to walking and cycling.

The smaller neighbourhood shopping centres do not generally have the same development pressure and scale of development as the town centre (Kuripuni village could be an exclusion to this given recent development and its attractiveness as a location for mixed use activities). However, given the residential context in which they are generally located, any further development of neighbourhood shopping centres would need careful management to minimise adverse effects

Under the District Plan, the Commercial Zone has two distinct types of environment: pedestrian-oriented and vehicle-oriented commercial areas. Pedestrian-oriented commercial environments are focused on providing customers a range of shops and services accessible by foot, usually protected by verandas. These pedestrian areas are located in the core of the Masterton town centre, as well as a number of smaller neighbourhood shopping centres.

Masterton has a number of industrial areas, the largest areas being in the Ngaumutawa Road and Solway areas. The Waingawa Industrial Area, while within the Carterton District, also lies in close proximity to Masterton and provides an important industrial land resource. Industrial activities in these areas range in size from large-scale enterprises employing many people and generating significant income for the area to much smaller-scale

businesses. Industrial activities are an important resource for Masterton (and the wider Wairarapa) and for its social and economic wellbeing. Under the District Plan, industrial areas are managed under a single Industrial Zone which seeks to cluster industrial activities within defined areas where they may operate and generate comparable effects relatively unhindered and are separated as much as practicable from sensitive activities in other zones to protect the amenity in those zones.

4.3. TRANSPORT DEMAND AND USAGE

There are approximately 278km unsealed and 523km of sealed carriageway in the roading network. The network also includes approximately 200km of footpaths, 2,500 streetlamps, 3,700 signs 40km of drainage culverts as well as kerbing, channels and associated drainage structures. State Highway 2 is the major road connecting Masterton and 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.

The most common method of getting to work is by driving a private vehicle – 64.4 per cent of people – compared to only 2.1 per cent of people using public transport to get to work. Analysis of car ownership in 2013, indicates 47.4 per cent of households in the Masterton District had access to two or more motor vehicles, compared to 42.5 per cent in the Wellington Region. Therefore, our focus is on changing to alternative mode of transportation as walkways and cycleways.

The Wairarapa railway line cuts through Masterton with three stations at Solway, Renall Street, and central Masterton. Masterton the 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. There is a steady increase in of travellers on the line . In 2018-2019 , The number increased by 29 per cent . As a result of COVID-19 and a better understanding of how employers can offer remote working condition, Masterton may see an increase in people wanting to live in Masterton and commute to Wellington using rail as the main mode of transport.

The increase in the use of the service has put a pressure on the ageing old tracks and frequent service delay is a future concern. Masterton District Council has identified the issue and as a part of the Masterton Town Centre Strategy (2018) development found that the level of integration between the bus network and railway stations in Masterton (and other destinations such as the hospital and Kuripuni) could be increased to better serve people's needs. The govt has also recently announced $126 million of funding to upgrade the Wairarapa rail corridor to help increase the level of service.

Data from 2018 census has showed the demand of recreational cycling and walks has increased by 4 per cent from 2013. The roading network already offers some specific cycle facilities (including cycle lanes) in the urban area and the council has made significant investment in the recreational trail network in recent years which is increasingly popular with both tourists and residents. Such as a community-initiated project to develop a region-wide recreation trail linking the five main Wairarapa towns. "Five Towns Trail Network ", a large recreational cycle trail linking the five towns.

4.3.1. CHANGES TO CUSTOMER EXPECTATIONS

Customer expectations may influence service levels and demand for services. Changes that are likely to impact on roading services include customers wanting:

- better quality roads in general as a result of higher expectations given improvements in both vehicles and roads over time
- greater emphasis on road safety in roading design due to increased awareness of road safety matters
- both environmental and public health campaigns to promote 'active transport' (walking, cycling and E Bikes) overusing motor vehicles are likely to result in greater demand for cycling lanes, alternative footpaths etc

- development and increased use of autonomous vehicles.

It is anticipated that the following safety issues will become an increasing priority for the Council in determining design and operational standards:

- road and shoulder widths
- surface condition of sealed and unsealed roads
- intersection controls
- destination signage for tourists
- railway crossing safety
- reduction in the number of loss of control crashes
- footpath issues relating to elderly / mobility scooters

Some allowance has therefore been made in programmes for targeting improvements relating to safety. It is important to prepare and implement the Road Safety Action Plan to assist in addressing the safety issues within asset management.

Changes in customer expectations can be determined through community consultation (e.g., Communitrak survey) and feedback processes. Customer expectations will be monitored and assessed. Trends will be monitored, and this plan updated accordingly.

4.3.2. TRAFFIC COUNTS

In road networks, the patterns of traffic flow change over time. Across the Masterton District network as a whole, the average daily traffic is increasing, but the increase is not uniform. Some roads have high traffic growth, while others are declining.

The indicative growth rates below have been determined from a representative sample of roads and are set out below in table 4.4

Table 4.4 Traffic growth

TRAFFIC GROWTH		
Road Type	2020 Annual Growth	Basis
Urban Access/low	1 %	Average over count programme of traffic counts.
Urban Medium	0.3 %	Average over count programme of traffic counts.
Rural Primary	0 %	Average over count programme of traffic counts.
State Highways	1.5%	Annual traffic counts from south of Intermediate St .

4.4. WALKING AND CYCLING

Cyclists and people who prefer walking may be expected on any road – like motorists, they will want to go from any one place to any other place. Masterton has 208 km of footpath, and an annual renewal forward works programme. More than $100,000 has been secured to progress a community-initiated project to develop a region-wide recreation trail linking the five main Wairarapa towns (Masterton's investment of $30,000,). Much cycling activity around Masterton District is on local roads, but (especially for less confident cyclists and family groups) off-road trails are also being developed. Development of such trails tends to be led by voluntary sector trusts or service organisations, who rely on support from the public and private sources. The co-operation and support of private landowners is also very important since some trails or cycle routes pass through private land. Since 2012, Masterton District takes manual counts at four locations every year. These counts have registered a small growth especially between peak hours of morning and afternoon. The council has already started building its "off-road recreational trails network and is

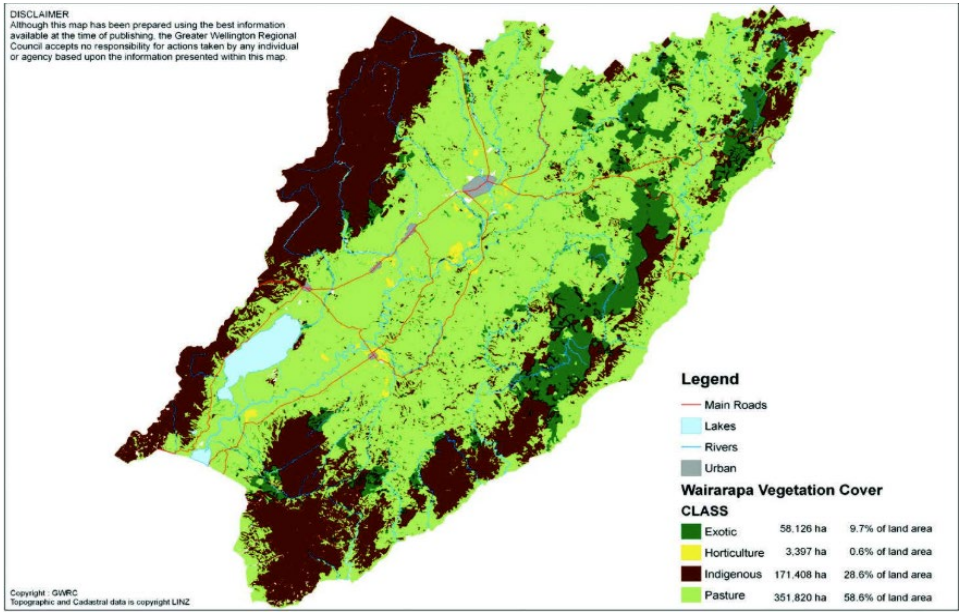
providing $267,000 (over 10 years) for cyclists likely to use "off-road recreational trails". A further $259,000 (over years two and three) is for those likely to use "rural district network trails that will link into the national network" with an additional $20,000 allocated for year one investigation.

4.5. FORESTRY

Activities based around harvesting forests are set for long-term increase. Forest harvesting activities will be the single largest influence on the need for improvements and upgrades in the rural network in the foreseeable future.

The last two decades has seen intense phases of forestation in the Masterton region. Due to these phases of large-scale forest establishment, forest harvest of plantation blocks will coincide as they reach maturity changing road usage patterns and placing pressure on the road network. Log haulage companies gave a capacity of approximately 110 trucks a day on the region's roads. Each truck will complete 2-3 loads a day totalling approximately 270 truck movements. If full volume yield was to be utilised this will require 350 truck movements a day. There are over 100 truck movements a day into the Waingawa industrial hub south of Masterton to the rail hub and domestic mills (S.Andrew, Woodflows of the Eastern Southern North Island 2019-2028)

Figure 4.2 Wairarapa land use



4.6. 4.6 HONEY INDUSTRY

The local beekeeping industry has been lifted by strong demand for New Zealand honey in export markets. This increase was driven by the strong market demand for Manuka honey and is continuing to grow in Wairarapa.

Wairarapa is following the trend and currently has approximately a hundred thousand hives managed by 7 major and approximately 30-40 medium to small beekeeping enterprises.

4.7. PASTORAL FARMING

It is expected that traditional pastoral farming of sheep and beef, and to lesser extent deer, will continue to be a significant contributor to future demand on the rural transportation network. Dairy farming is an important growth industry in the Masterton region with international demand for dairy produce making it a significant contributor to the local economy.

4.7.1. RURAL LAND USE

Being a predominantly rural district opportunities exist for the increased development of wood and food production. Any increase in activity in this sector will have implications for Asset Managers and possibly for rural water supply management.

Land use data shown below is sourced for the Masterton District from GWRC and can be shown as follows:

Table 4.5 Land use

WAIRARAPA LAND USE		
Vegetation class	Hectares	Hectares
Horticulture	3,397	0.6%
Exotic forest	58,126	9.7
Natural Forest	171,408	28.6%
Other	390	0.1%
Pasture	351,820	58.6%
Settlements	2275	0.6%
Wetland - Open water	10395	2.9%
Wetland - Vegetated non forest	633	0.2%

Ministry data shows a decline in land use for farming in the number of hectares being farmed between 1994 and 2018. Over the same period there has been an increase in planted forestry and 'other sectors' land use. Overall, a slight decline in total land used is observed.

This data is for the Wellington Region as a whole and it is difficult to assess where within the region changes in land use for different sectors has occurred. However, assuming land use trends in the Masterton District are consistent with Wellington regional trends, we could see:

Further conversion of farming land for other uses, more forestry and 'other land' use; Less land use overall; the conversion of farm land on the outskirts of the urban area and the increase in rural population on the outskirts of the urban area; supports the likelihood of farm land conversion to lifestyle blocks here in Masterton.

While harvesting of forestry now is increasing, trends will need to be monitored and information from other sources obtained to build the picture and enable more accurate forecasting for the Masterton District.

Whilst more data is needed to enable more accurate projections, changes in land use could have effects on council assets such as solid waste and roading. For example:

Forestry: Increasing or declining land use for forestry ultimately equates to a change in the amount of wood processed and the level of waste by-products from manufacturing, such as sawdust and other process wastage. Forestry acreage changes are time progressive with the impact on solid waste management being at the time of harvesting and processing rather than the time of planting or conversion of land to forestry.

The council's forecast of forestry impacts on roading looks at sealed and unsealed rural roads. The current main drivers of Forestry impact on Masterton District roads are;

- The quantity and location of harvesting can be predicted, and the council will consult with forestry owner to project any roading needs.
- The likely quantity of rehabilitation required can be readily catered for in the existing programme and future budgets.

- 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.

The current prediction of harvest volumes levels of harvesting will continue to increase from current levels over the next 10 years.

Farming: The sheep, beef and dairy industry in the Wellington Region is not expanding; there is a reduction in the number of animals being farmed, which suggests less intensive farming than in previous years. The impact from expansion of this industry in the future, if any, will be minimal in the next ten years. As a result, the volume of traffic, and particularly trucks, associated with farming is also likely to decline.

4.8. CLIMATE CHANGE

Council supports the GPS strategic direction on climate change. Climate change events such as increased flooding and ground water, greater storm intensity, increased landslips, sea level rise and warmer temperatures are exacerbating existing problems to the transport network. These are pressing issues for our Masterton urban and coastal districts, such as Mataikona, Castlepoint and Riversdale.

Government support and funding will be required to help develop and implement policies for climate change adaptation and help New Zealand reach its Climate Change Zero Carbon Act goals. Mode shift is one of the major areas medium provincial communities can help to deliver climate change outcomes through less urban vehicle trips. Funding to help with this is required to deliver supporting infrastructure which assists mode shifts and supports vehicles to use environmentally friendly fuel types across New Zealand.

Average coastal sea levels in New Zealand rose by 17 centimetres over the past century and will likely rise by a further 60–110 centimetres by 2100 relative to 1986–2005 levels. Sea-level rise and larger storm surge tides increase the frequency of coastal inundation. In Masterton District, areas like Matakona and Castlepoint, Riversdale are subject of occasional coastal hazards and likely to suffer increased risks with a warming climate.

As a result, road infrastructure in the coastal zone is likely to be exposed to greater risks from inundation and coastal erosion:

- High waves and stormy conditions may wash away roads, disrupting access and requiring major repairs to restore road links. Potential for injury/death to road users exists.
- Coastal inundation and increased sea level rise may increase erosion of coastal structures, requiring more frequent inspection and repairs, and causing potential disruption.
- Increased saline incursion at coastal bridges may lead to accelerated material deterioration.

Masterton region compared to 1995, temperatures are likely to be 0.7˚C to 1.1˚C warmer by 2040 and 0.7˚C to 3.0˚C warmer by 2090.Masterton region is projected to have from 6 to 40 extra days per year where maximum temperatures exceed 25 degrees, with around 5 to 13 fewer frosts per year. The Wairarapa is predicted to experience a significant increase in hot days. Annual hot days (>25°C) may increase from 24 days now to 54 days by 2050.

Flooding risks, including those affecting the Masterton urban/built-up area, will likely increase as a result of the predicted occurrence of more extreme rainfall events. Increased extreme weather events will more than likely impact on all three of the council's water services.

The effects of climate change may bring significant costs to the community. As extreme weather events become more frequent or severe, the costs and damages associated with them are also likely to increase. The costs of dealing with stock losses, replacing or repairing damaged transportation infrastructure, property and increased soil erosion and nutrient loss could be formidable. Based on projected climate variables the average weather induced degradation of road transport infrastructures will only slightly increase in future.

4.9. CONCLUSION: IMPACT ON TRANSPORTATION ACTIVITY

- Masterton total population is expected to remain stable over the next 20 years. (1% growth on average – Infometrics Sept 2020 post covid-19 prediction report for Masterton and Wairarapa to 2051) Population trends impact upon the roading assets, in some cases creating demand for new subdivisions and associated dwellings as well as increasing demand for council services
- Due to the reduction of the average number of people per household, housing projections are on a rising trend. Masterton Urban Growth Strategy, Planning for Growth to 2043 (2019) provides a guide to future residential and industrial development in Masterton and to assist in asset management planning.
- Existing roads may need to be upgraded to service the shift toward urbanisation and the associated increased use of areas of the current network. This could involve realignments or the sealing of existing metal roads.
- Requirement to provide for additional commercial car parks to accommodate growth.
- There will be pressure on maintenance budgets in the future as growth and development places increasing demands on the existing infrastructure.
- It can be expected that there will be increased traffic loadings generated by trucks movements from forestry operations.
- The traffic at some intersections in the urban area can cause frustration through queuing and short delays and has the potential to cause safety related issues.
- Currently delays due to peak flow congestion are short by national standards, seldom exceeding 5 to 10 minutes.
  - As a result of development new and upgraded roading and associated infrastructure is needed to provide improved and safer links.
  - Millard Ave
  - Andrews Street
  - Upper Plain Road
  - Chamberlain Road
  - Judd's Rd
  - Ngaumutawa Road
  - Gordon Street/Kitchener Street

All developments will lead to increase in operations, maintenance and capital work costs which in turn will lead to increase in costs to the ratepayers.

4.10. DEMAND FORECAST

The impact of demand drivers on future roading and footpath assets are summarised below:

Table 4.6 Demand Forecast - Roading and Footpaths

DEMAND FORECAST - ROADING AND FOOTPATHS		
Roading demand driver	Impact in future	Future demand (for the next ten years)
Total population	Low/moderate	Increased Impact
Traffic volume	Moderate	Increased maintenance and renewal program
Heavy class Vehicles	Moderate	Lifting weight restriction from some posted bridges

Tourism	Low/moderate	Efficient accessibility to tourist spots
Land use (including Forestry)	Moderate	Increase in heavy (max) traffic and upgrading rural roads
Pastoral farming	Low	No impact
Improvement in the service level	Low/moderate	Outcomes from service level review, public consultation and annual plan submissions
Changes in customer expectations	Low/moderate	Increased overtaking opportunity and cycle lane
Climate change & resilience	Moderate	Raised bridges, erosion flooding and increase drainage work
Footpaths demand driver	**Impact in future**	**Future demand (for the next ten years)**
Total population	Low/moderate	Low impact
Elderly population	Moderate	Footpath surfaces and widths will increasingly need to be upgraded to accommodate growing numbers of mobility scooters
Tourism	Low	No impact beyond current LOS

4.10.1. NON-ASSET BASED DEMAND MANAGEMENT

Both environmental and public health campaigns to promote 'active transport' (walking and/or cycling) overusing motor vehicles are likely to result in greater demand for cycling lanes, alternative footpaths etc.

4.10.2. CAPITAL WORKS PROGRAMMES

Table 4.7 Work Required to Meet Growth & Demand

WORK REQUIRED TO MEET GROWTH AND DEMAND				
Action/Work	Driver for Action	Estimated Cost	Scheduled For	How this will be funded
Climate Change	Climate change impacts will require future work to mitigate and/or adapt.	Potential project costs are unknown.	2021-2031	Investigative work will be covered by existing budgets,
Alfredton - Tinui Road Enhancement	Maintenance / Improvements for the wind-farm generation installations.	(Project awaiting permission)	2021-2031 (TBC)	Funded by the developer
50Max route upgrades (bridge strengthening)	Requirement to open routes to allow 50Max vehicles access to forestry and other land use areas	Project costs are determined	2021 - 2031	Investigative work will be covered by existing budgets, physical works funded from rates and subsidy.
Urban traffic congestion	Intersection, Road configuration and One-way system changes	Project costs are determined	2030- 2040	Investigative work will be covered by existing budgets, physical works funded from rates and subsidy.
Urbanisation of key developing areas	Development of peri urban streets in areas such as Millard, Andrews, Upper Plain Chamberlain, Kitchener, Gordon, Solway	Project costs are determined	2030- 2040	Development contributions and subsidy/rates where assets are at end of life and NPV calculations are positive

5. PROGRAMME BUSINESS CASE

5.1. OPTIONS, ASSESSMENT AND ALTERNATIVES

5.1.1. 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.

Figure 17: Road asset deterioration and the impact of maintenance activity

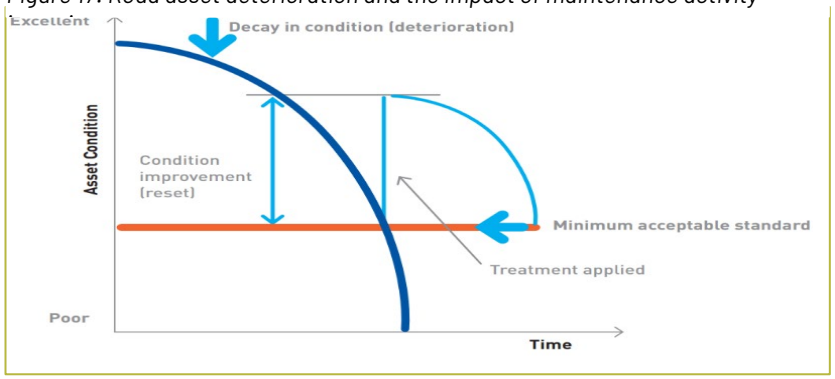


Table 5: Line of Sight

PROBLEM	BENEFITS IF ADDRESSED	TREND	STRATEGIC RESPONSE	ACTIVITY/WORK CATEGORY
Aging and deteriorating network • Ageing infrastructure • Vulnerable key routes • Durability and resilience risk • Urban peri urban population growth pressure • Missed economic opportunities	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. Relationship approach; build credibility with councillors, stakeholders, and contractors.	Sealed and unsealed pavements and footpaths: 111,112, 125, 211, 212 & 214

PROBLEM	BENEFITS IF ADDRESSED	TREND	STRATEGIC RESPONSE	ACTIVITY/WORK CATEGORY
			Programme adjustment; improve drainage programme	
Safety • Topography • Active modes • Speed • Intersection form • Serious and fatal incidents	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 • Changing user demands • Increase LOS for heavy haulage • Social well-being	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
Affordability • Competing council priorities for finite local share • Limited resources (materials and people) are increasing the cost to do the work • Increasing regulations and environmental costs	Asset maintained at sustainable levels Adequate funding for maintaining the network at the appropriate service levels A fit for purpose programme that can reduce the backlog of renewals	New	Improve value for money; reduce cost where possible and use SMART procurement. Extend the life of assets at no cost where possible using tools such as deterioration models. Apply the right treatment at the right time. Funding approach: increase local funding around work programmes that have seen increased rates.	Network and asset management - 151 Sealed and unsealed pavements 111,112, 211, 212 & 214

5.1.2. TEST LOS, CURRENT CONDITION AND PERFORMANCE (EVIDENCE AND GAP ANALYSIS)

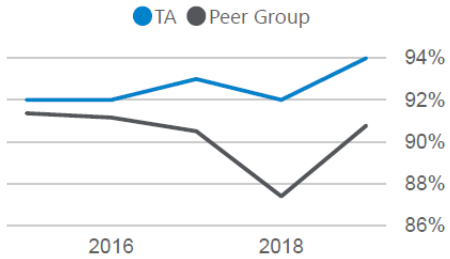
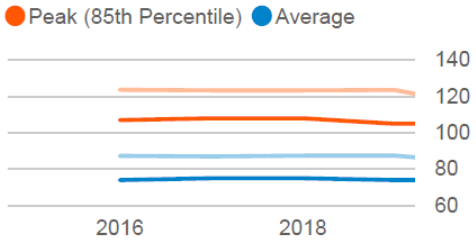
The following section analyses options for addressing the problems and issues identified in the strategic case.

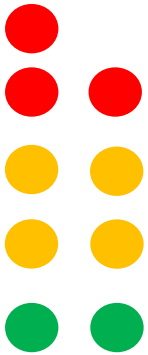
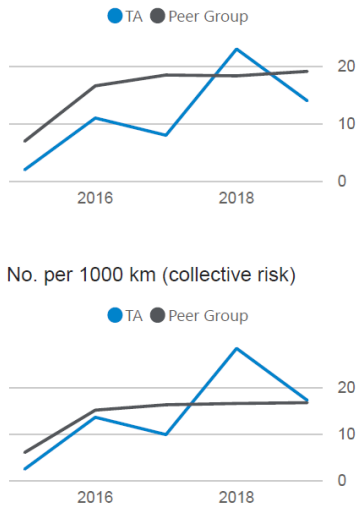
The current condition and performance of the roading assets is presented below against our peer group (where available). It is analysed, where possible, against the ONRC customer outcomes and customer level of services.

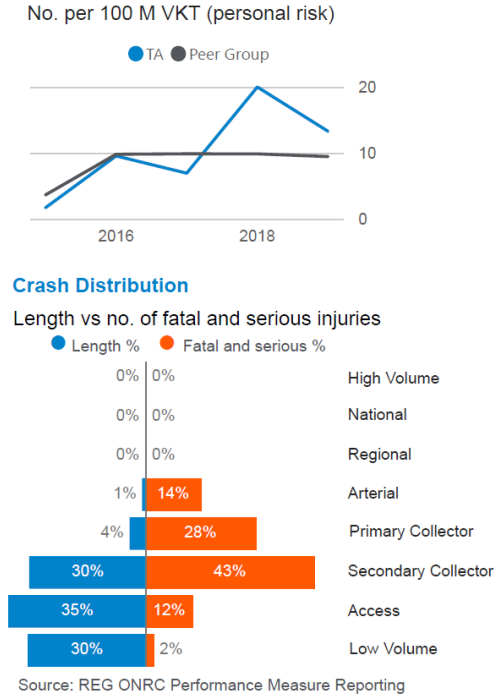
This colour-coded rating system is based on a qualitative assessment of the LOS and cost comparison data.

Good Improvement Required Poor

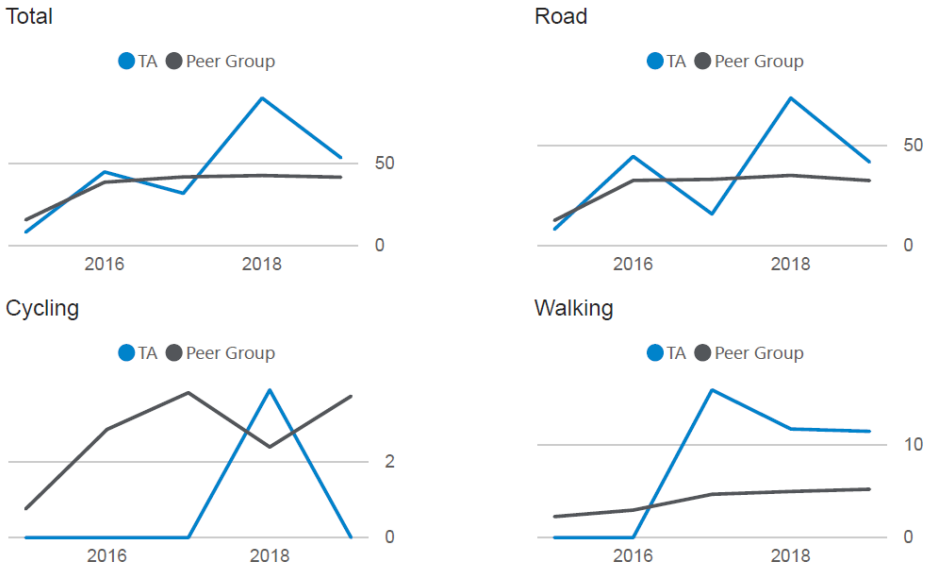
Table 5 Evidence and Gap Analysis

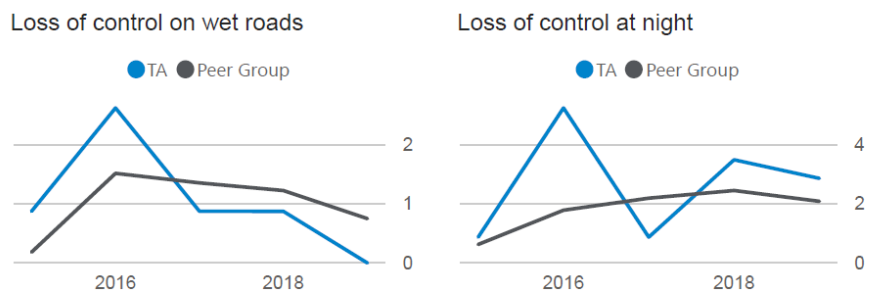
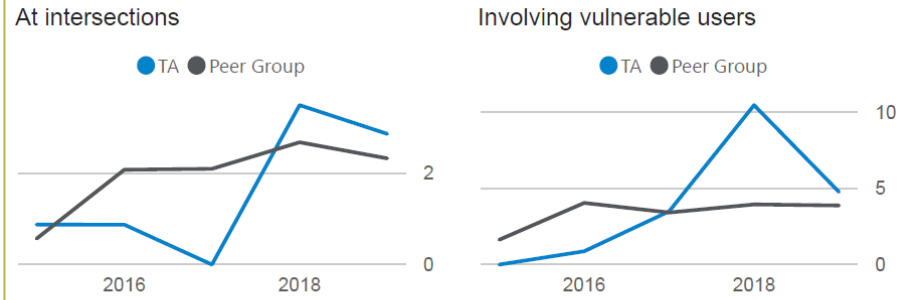
Amenity Smooth Travel Exposure and Peak and Average Roughness N.B Overall the network ride quality (road roughness) is performing very well. The roughness surveys have been intermittently collected for the past 10 years, with surveys completed every 2 years. The MDC network is providing an excellent ride quality for the road user, considering the network average results from the surveys.	ONRC Arterial Primary Collector Secondary Collector Access Low Volume	Urban / Rural	**Road Condition** Ride quality (roughness of the roads)  Source: Waka Kotahi Data and Tools Peak and average road roughness (NAASRA) (peer group lighter)  Source: REG ONRC Performance Measure Reporting

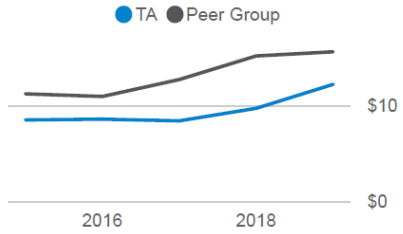
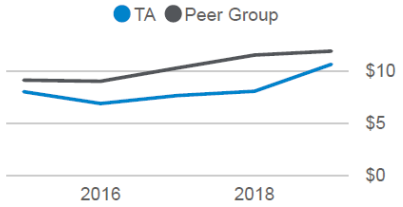
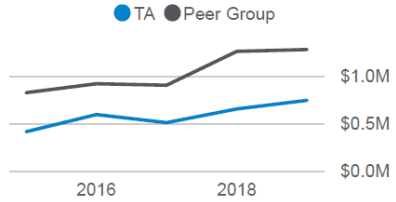
Safety and Amenity	ONRC	Urban / Rural	Fatal and Serious Injuries
	Arterial Primary Collector Secondary Collector Access Low Volume		 Source: Waka Kotahi Crash Analysis System and Data and Tools



Source: REG ONRC Performance Measure Reporting

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

Technical Outputs Safety	Wet Night Intersections Vulnerable Users	**Fatal and Serious Injuries (No. per 100,000,000 Vehicle km Travelled)**  Source: Waka Kotahi Crash Analysis System and Data and Tools 

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 centers 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 ($1000 / km)  Maintenance, operations and renewals expenditure / length ($1000 / km)  Investment management, network and property management 

Cost Efficiency Surfacing	ONRC	Urban / Rural	Key Question: How does the cost of maintaining my sealed road network compare to others?
	Arterial Primary Collector Secondary Collector Access Low Volume		

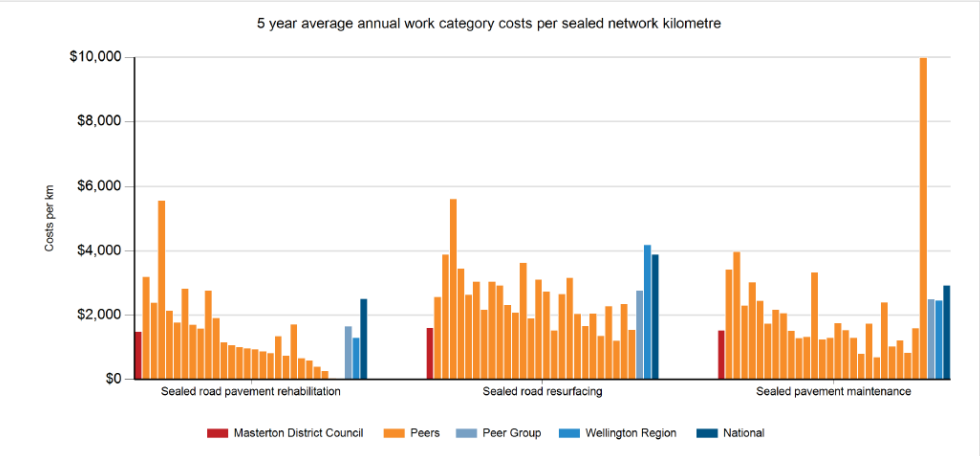
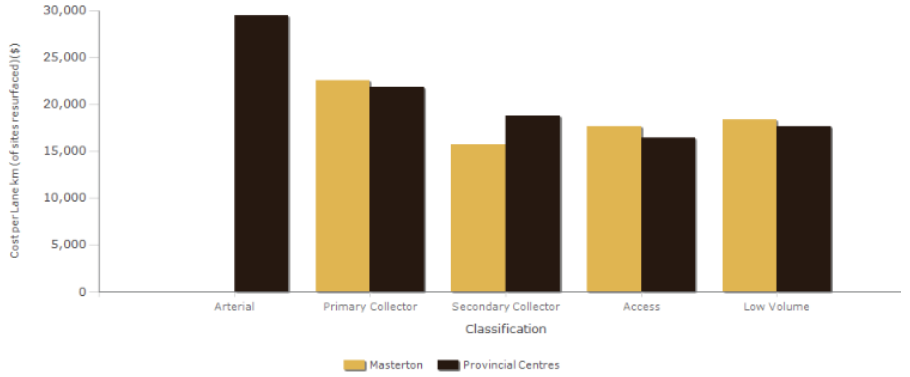
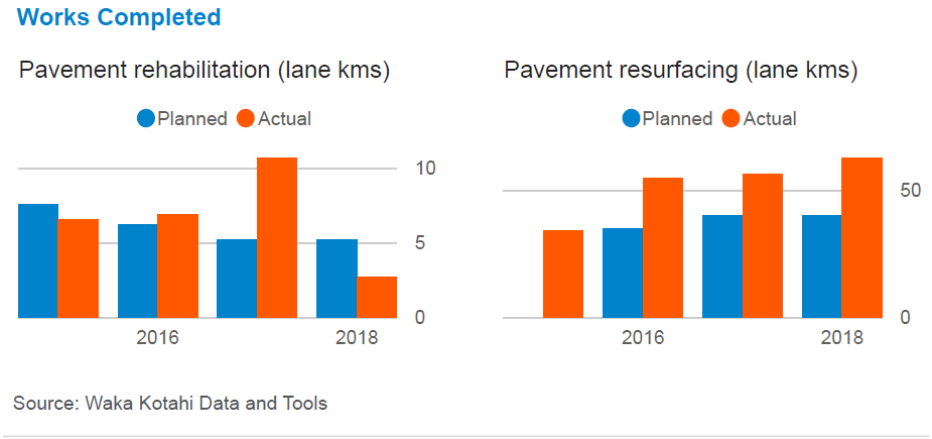
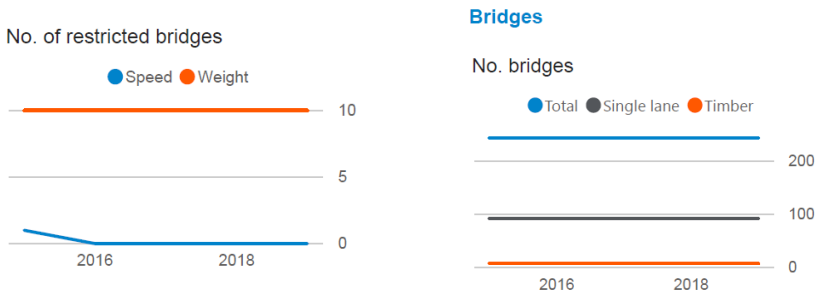


Figure 10: Sealed road maintenance costs per kilometre - Sourced from NZ Transport Agency TIO Work Category funding reports

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

Peer Group Comparison 5 years Cost

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

Overall Network cost

Unsealed

Key Question: How does the Overall network cost compare to others?

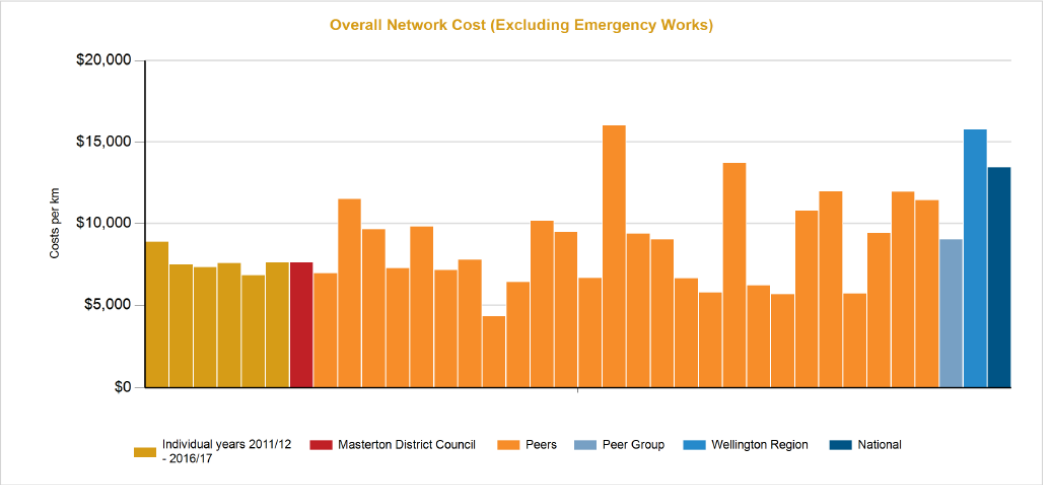


Figure 12: Overall network cost (excluding emergency works) per kilometre - Sourced from NZ Transport Agency TIO Work Category funding reports

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

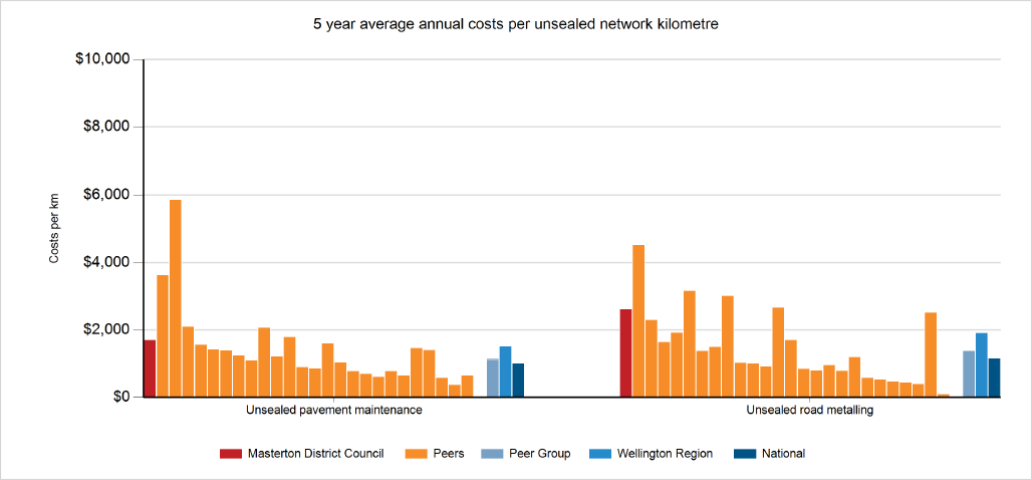
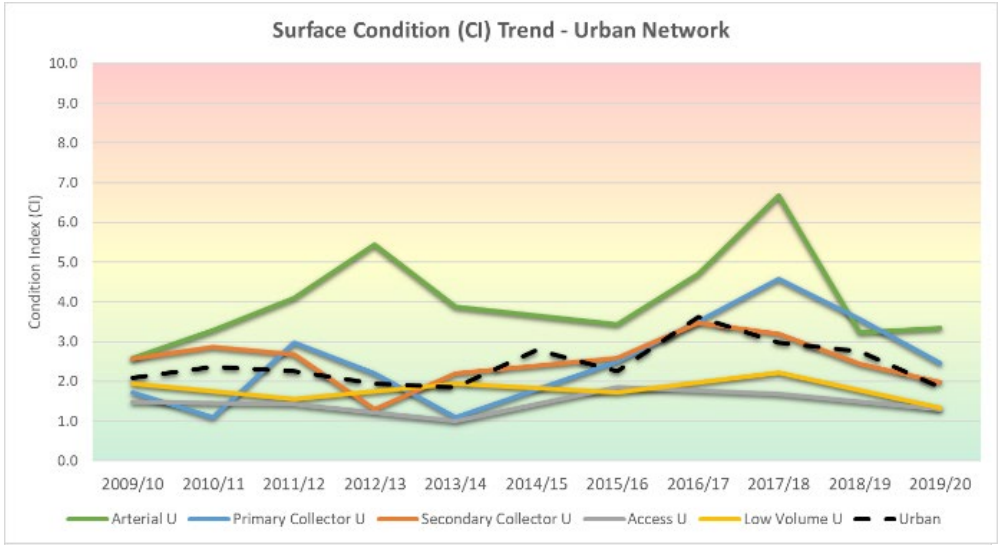
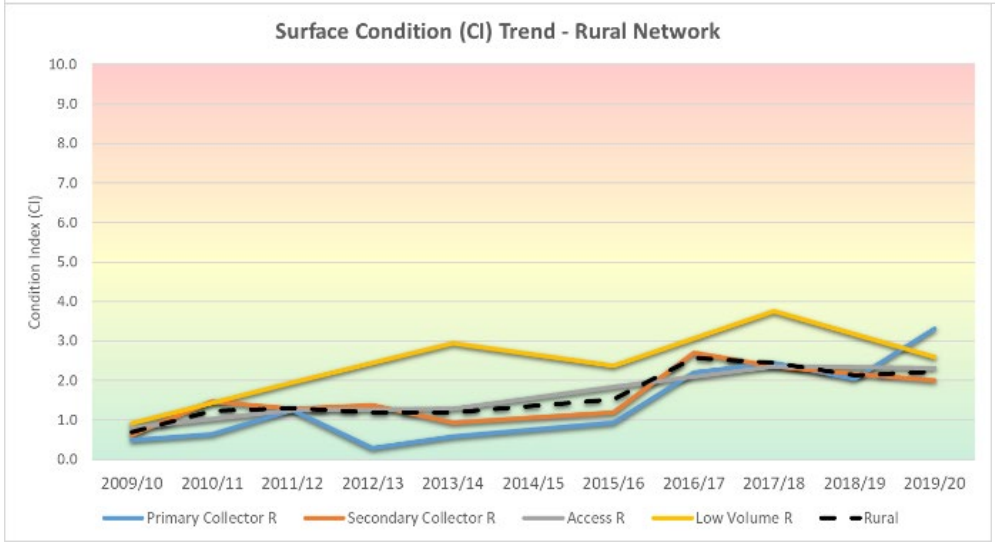


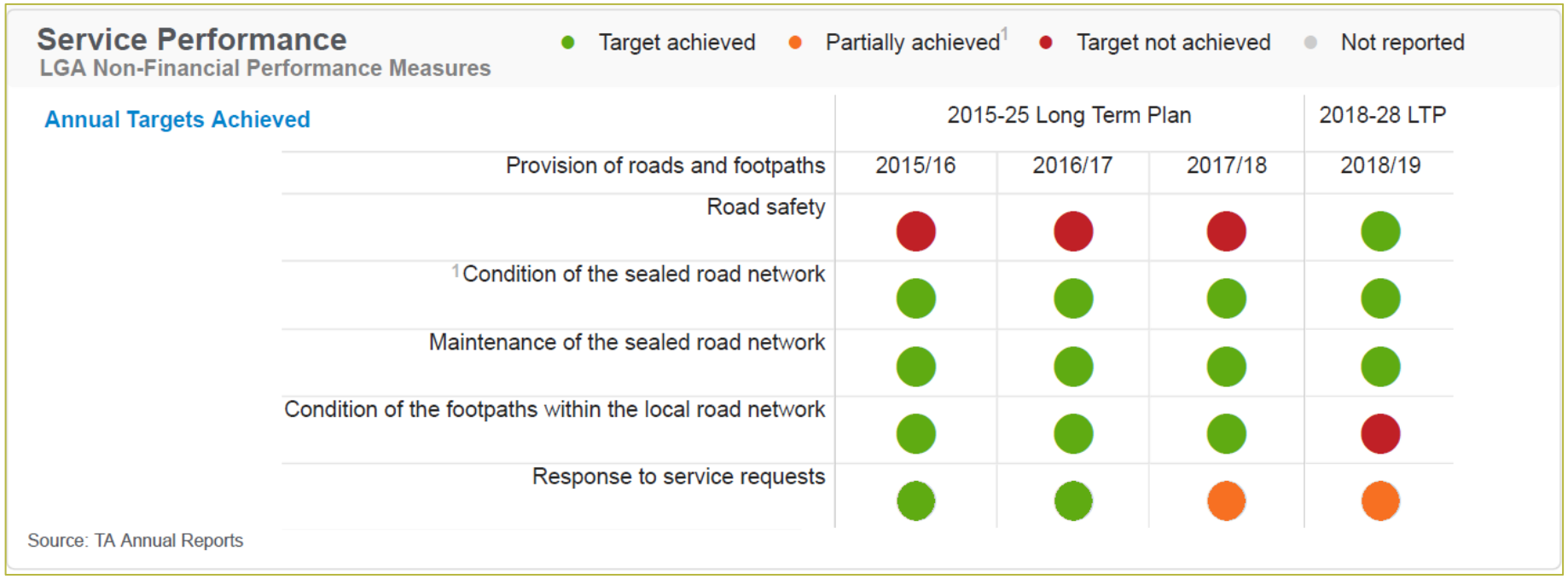
Figure 11: Unsealed road maintenance costs per kilometre - Sourced from NZ Transport Agency TIO Work Category funding reports

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 2010, with the Primary Collector getting 3 times worse in 10 years. 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 Arterial Primary Collector Secondary Collector Access Low Volume	Urban / Rural	 

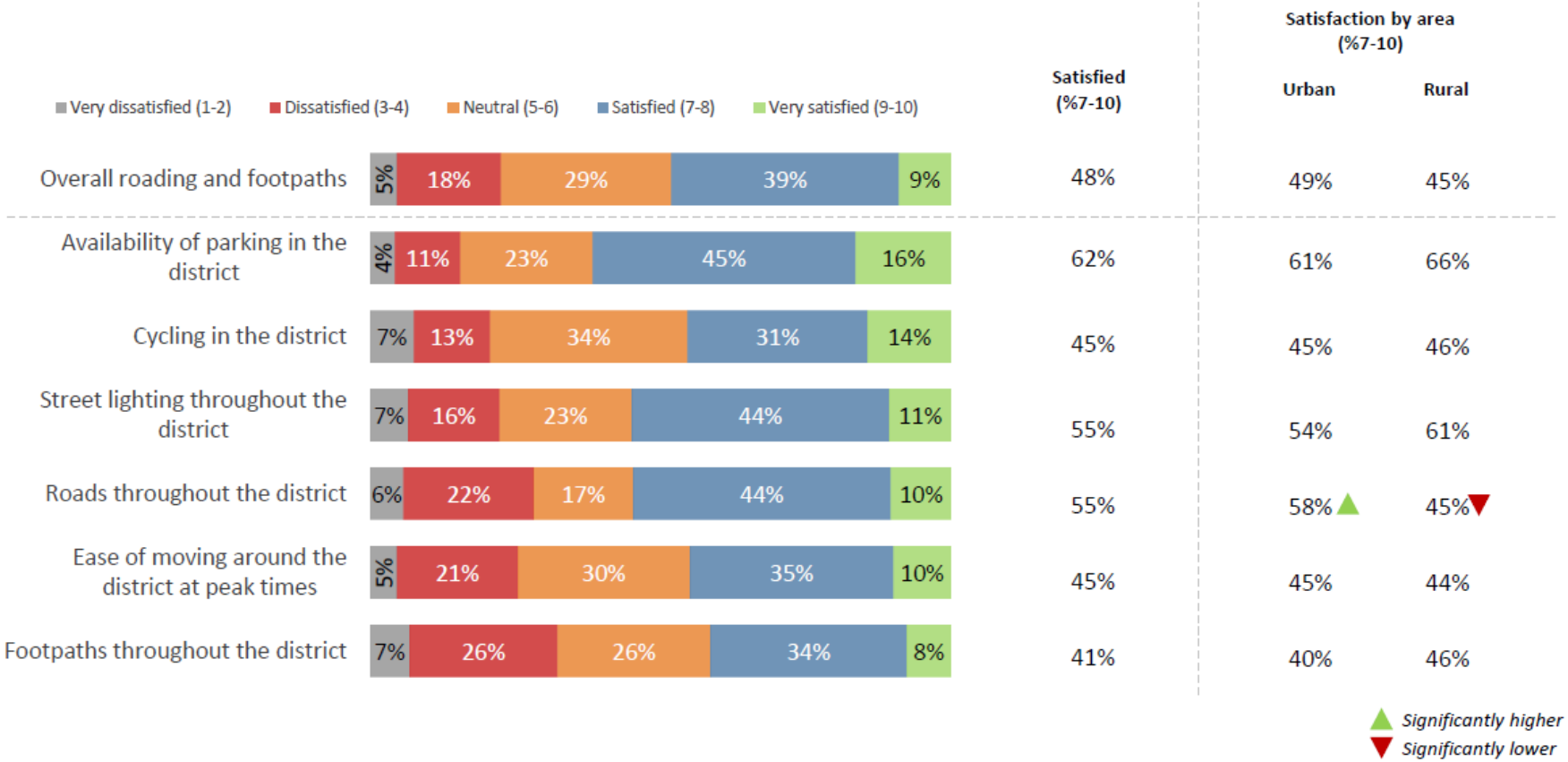
Provincial Centers Peer Group

This peer group includes Cities and Districts with a proportion of ONRC classified network equaling 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, Opotiki 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.



Roads, footpaths, lighting and parking



NOTES:
1. Sample: n=562; Urban n=398, Rural n=167; Excludes Don't knows
2. ID1. How satisfied are you with each of the following Council services?
2. ID1_7: Everything considered, how satisfied are you with the roading-related infrastructure and how this is maintained?

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5.1.3. 2019 RETENDERED MAINTENANCE OPERATIONS AND RENEWALS PROGRAMME

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).

A comparison has been undertaken to highlight some key changes that have resulted from the increases in scheduled rates when compared to the previous contract this has been highlighted in financial impact table of each section of this PBC, key increases are highlighted below:

- Traffic management cost were separated from the schedule items all previous rates were inclusive of traffic management. This has created a safety orientated system with reasonable charge out rates for the contractor but resulted in an overall increase in our TTM costs.
- Pavement repairs and unsealed road maintenance + 65%
- Installation of traffic signs + 91%
- The schedule day work rates + 5%
- Surfacing renewals + 18%
- Pavement marking + 37%
- Preliminary and general +2203%

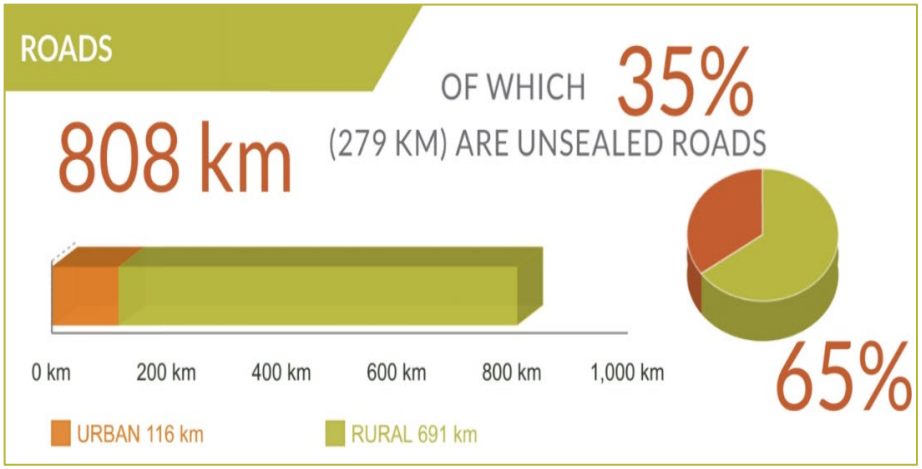
5.2. SEALED PAVEMENTS

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

5.2.1. INTRODUCTION

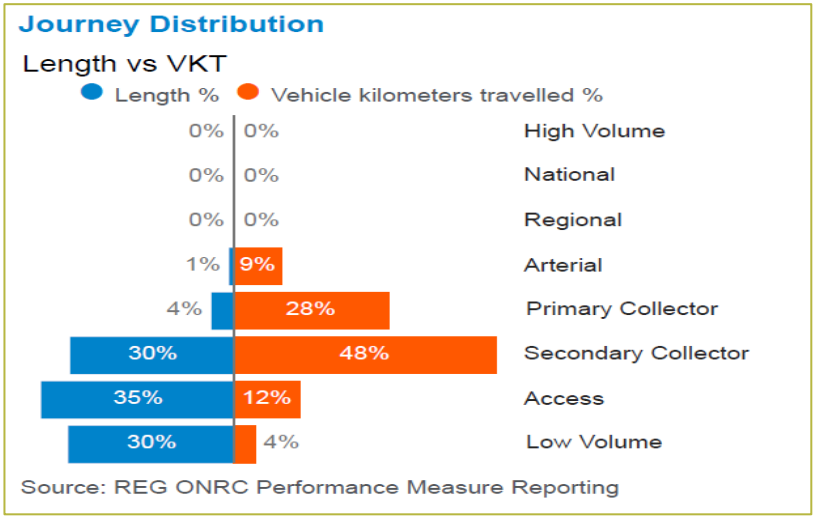
The purpose of sealed roads is to provide a network that is suitable for the effective movement of produce and people. It has a safe suitable all-weather surface that is appropriate to its location and functions suitably for its level of service.

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



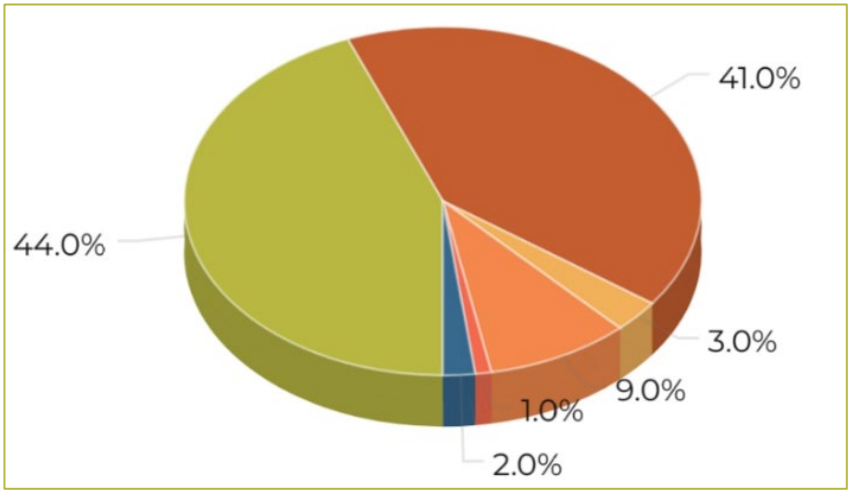
The sealed network is divided in to 5 different ONRC Categories namely:

5. Arterial (1.4% of total lane length)
6. Primary Collector (6.3% of total lane length)
7. Secondary Collector (49% of total lane length)
8. Access (35% of total lane length)
9. Low Volume (8.7% of total lane length)



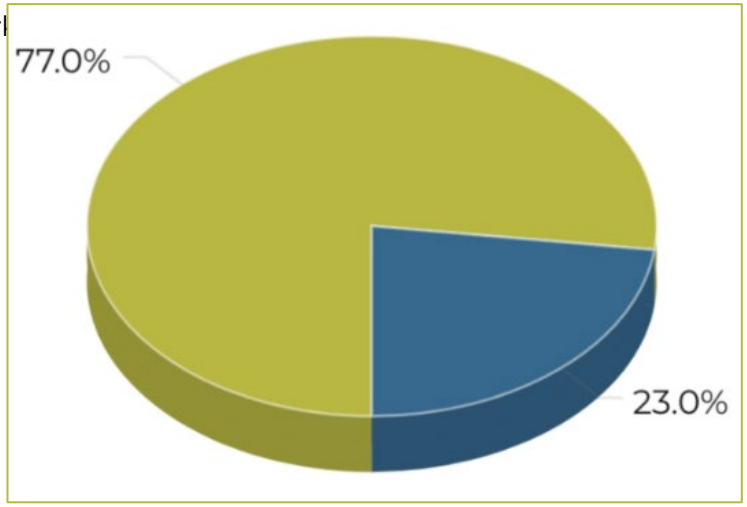
The network surface consists mainly of chip seals with a small percentage of asphalt. The distribution is as follows:

10. 1CHIP (44%)
11. 2CHIP (41%)
12. AC (3%)
13. RACK (9%)
14. VFILL (1%)



Finally, the sealed distribution between urban and rural roads on the Masterton DC networ

15. Rural (77%)
16. Urban (23%)



There are limited historical records the sealed pavement structural layer. However, it is estimated that the age of original pavements varies from 5 years to 50 years. Every year, sealed pavements are upgraded generally by incremental granular overlay, or through various stabilisation methods.

In Masterton the transportation network is diverse which means multiple challenges to maintain pavements to customer and technical LOS. In order to satisfy the expectations from the public for a consistent, accessible and safe network with limited funding the prioritisation of pavement activities needs to be carefully balanced.

5.2.2. STRATEGIC CASE LINKAGE – SEALED PAVEMENTS

WORK CLASS (W/C)	PROBLEM /OPPORTUNITY	BENEFITS OF PROPOSED ACTIVITY	LINKAGE TO STRATEGIC COMMUNITY & GPS PRIORITY	CONSEQUENCES
111 Sealed Pavement Maintenance 212 Sealed Road resurfacing 214 Sealed Road Pavement Rehabilitation	Aging and deteriorating network Safety Affordability	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	A system 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. Proposal addresses DSIs in an area of High Concern (Communities at Risk Register – All deaths and serious casualties table)	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

5.2.3. 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.

Serious and fatal crashes in Masterton are showing an increasing trend with numbers being above the peer group in nearly all areas including intersections, loss of control at night and crashes with vulnerable users.

The amount of sealed and 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) at 2019 was 2.2, form Table 5 overall, we can see that the rural network has been slowly getting worse since 2010, with the Primary Collector getting 3 times worse in 10 years. While this CI value is still satisfactory, the concern is the steady decay rate.

Overall, this indicates that Masterton should pursue options to improve the condition, age of the network and its safety performance. 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 5 Evidence and Gap Analysis provides evidential support to the statements above.

5.2.4. SEALED PAVEMENT MAINTENANCE

Our sealed pavement maintenance strategy is to extend asset life and limit the need for expensive rehabilitation treatments through timely:

- Maintenance interventions
- Pre-reseal repairs
- Preventative maintenance
- Minimise life-cycle costs
- Maintain safety for road users

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:

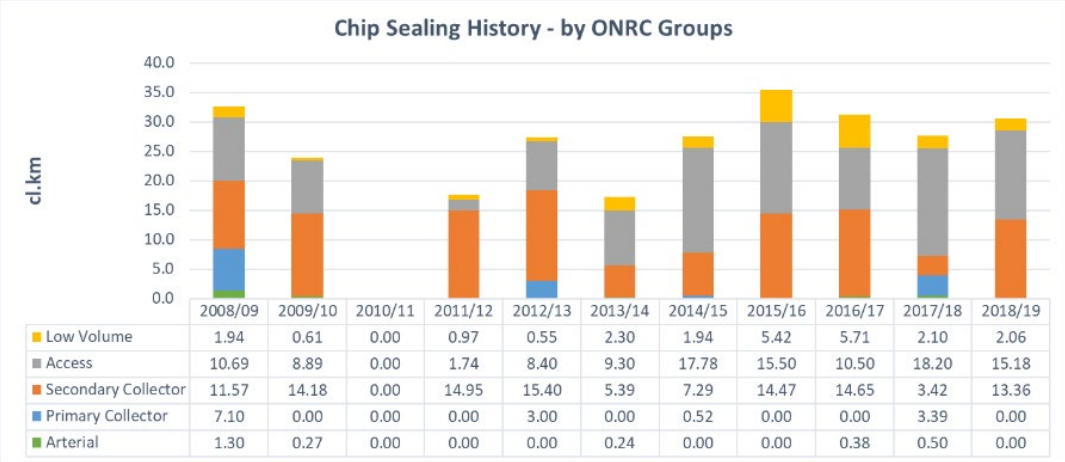
- geological challenges,
- changing agricultural sector with heavy loads
- peak in maturing forestry sector

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.

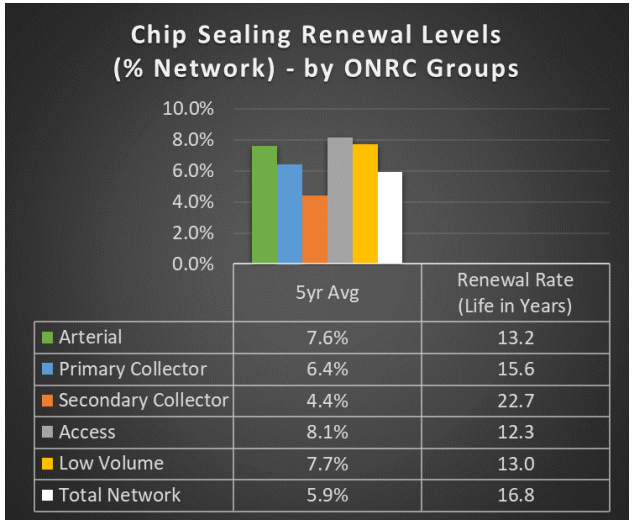
5.2.5. PAVEMENT RENEWALS HISTORIC WORK QUANTITIES

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.

Chip Sealing

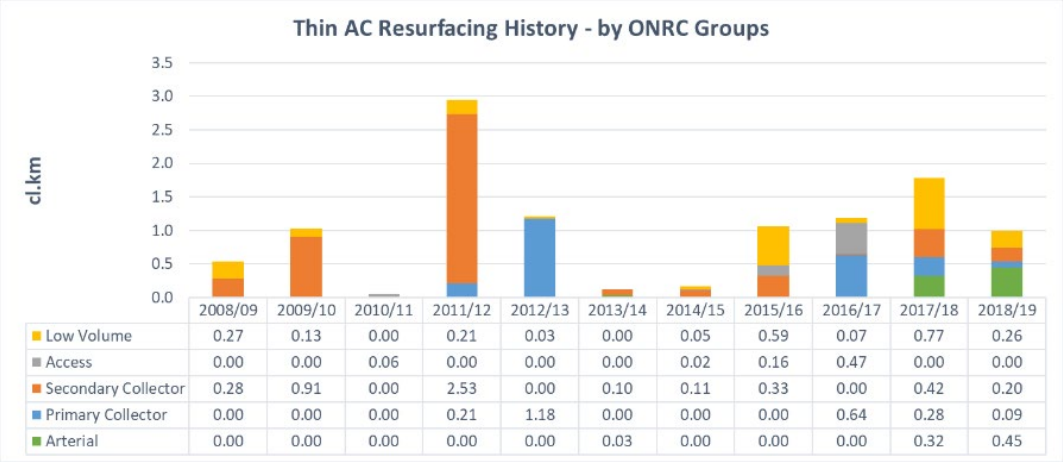


	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Low Volume	1.94	0.61	0.00	0.97	0.55	2.30	1.94	5.42	5.71	2.10	2.06
Access	10.69	8.89	0.00	1.74	8.40	9.30	17.78	15.50	10.50	18.20	15.18
Secondary Collector	11.57	14.18	0.00	14.95	15.40	5.39	7.29	14.47	14.65	3.42	13.36
Primary Collector	7.10	0.00	0.00	0.00	3.00	0.00	0.52	0.00	0.00	3.39	0.00
Arterial	1.30	0.27	0.00	0.00	0.00	0.24	0.00	0.00	0.38	0.50	0.00

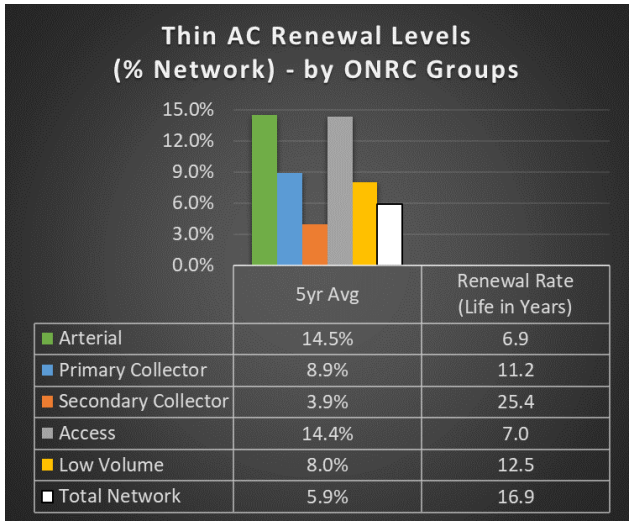


	5yr Avg	Renewal Rate (Life in Years)
Arterial	7.6%	13.2
Primary Collector	6.4%	15.6
Secondary Collector	4.4%	22.7
Access	8.1%	12.3
Low Volume	7.7%	13.0
Total Network	5.9%	16.8

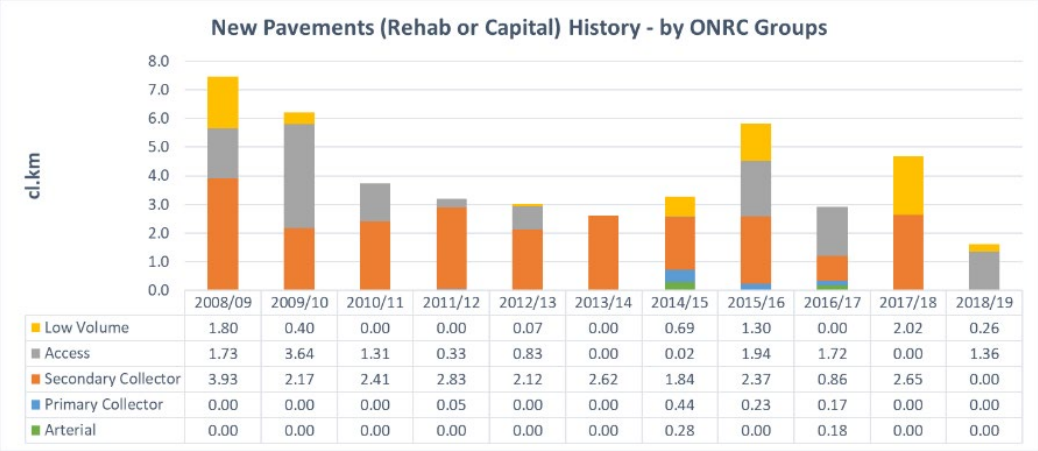
Thin Asphalt Resurfacing



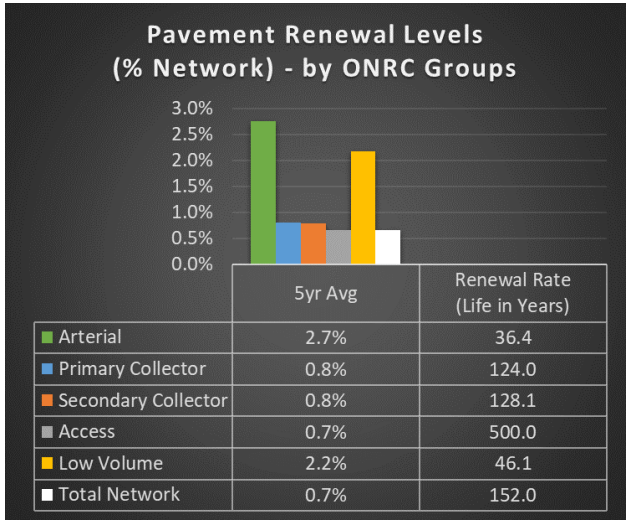
	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Low Volume	0.27	0.13	0.00	0.21	0.03	0.00	0.05	0.59	0.07	0.77	0.26
Access	0.00	0.00	0.06	0.00	0.00	0.00	0.02	0.16	0.47	0.00	0.00
Secondary Collector	0.28	0.91	0.00	2.53	0.00	0.10	0.11	0.33	0.00	0.42	0.20
Primary Collector	0.00	0.00	0.00	0.21	1.18	0.00	0.00	0.00	0.64	0.28	0.09
Arterial	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.32	0.45



	5yr Avg	Renewal Rate (Life in Years)
Arterial	14.5%	6.9
Primary Collector	8.9%	11.2
Secondary Collector	3.9%	25.4
Access	14.4%	7.0
Low Volume	8.0%	12.5
Total Network	5.9%	16.9



	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Low Volume	1.80	0.40	0.00	0.00	0.07	0.00	0.69	1.30	0.00	2.02	0.26
Access	1.73	3.64	1.31	0.33	0.83	0.00	0.02	1.94	1.72	0.00	1.36
Secondary Collector	3.93	2.17	2.41	2.83	2.12	2.62	1.84	2.37	0.86	2.65	0.00
Primary Collector	0.00	0.00	0.00	0.05	0.00	0.00	0.44	0.23	0.17	0.00	0.00
Arterial	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.18	0.00	0.00



	5yr Avg	Renewal Rate (Life in Years)
Arterial	2.7%	36.4
Primary Collector	0.8%	124.0
Secondary Collector	0.8%	128.1
Access	0.7%	500.0
Low Volume	2.2%	46.1
Total Network	0.7%	152.0

From the above we can see that historically, MDC has been renewing the surfaces, on average, every 17 years (5.9% per year), the pavements are renewed every 150 years (0.7% per year). These insights have been used to set the model parameters and target quantities for our programme review.

5.2.6. OVERVIEW OF DETERIORATION MODELLING

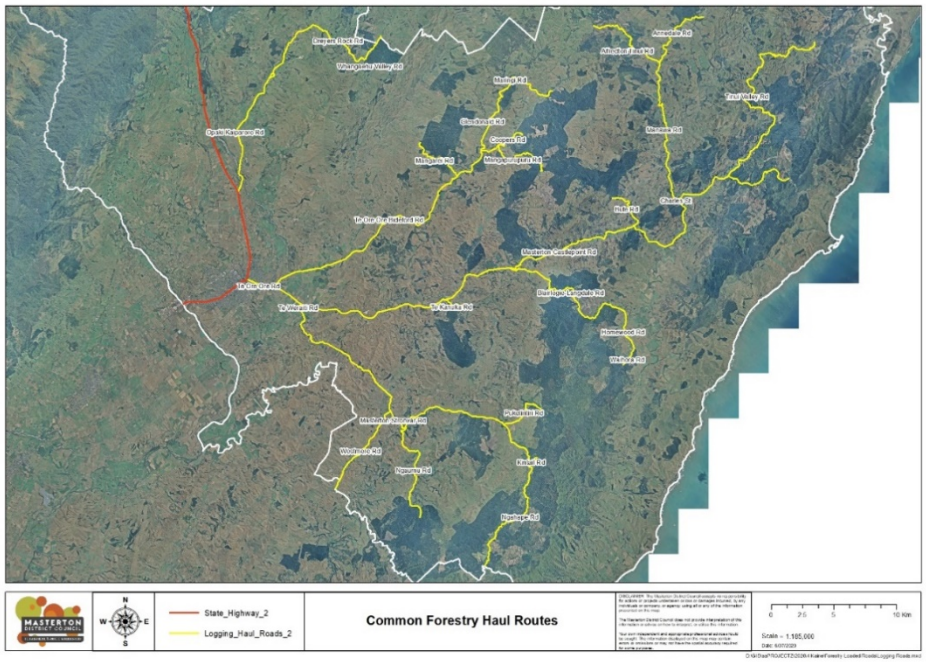
To undertake the pavement and surfacing modelling, Juno Viewer was used. The Juno Viewer platform is a data analytics tool, using the existing data from within the MDC RAMM database and other data sets. The Juno Viewer platform also contains a pavement modelling framework. This model framework has been 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 Figure 18, to ensure that these routes get preference and we prioritise their treatment as well.

Figure 18: Forestry Routes



Optioneering scenarios Results

Based on the above data and the problem definition, MDC considers the following strategic response for the sealed renewals.

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

- Open
- More – 20% more than current budget
- Current – current expenditure
- Less – 20% lower than current budget

The available budget for each strategy is shown in Table 6.

Table 6: Budget Quantities per category

TREATMENT CATEGORY	MORE BUDGET	CURRENT BUDGET	LESS BUDGET
Surfacing (Chipseal and ThinAC)	$ 1,170,000	$ 900,000	$ 630,000
Heavy Maintenance	$ 130,000	$ 100,000	$ 70,000
Rehabilitation	$ 975,000	$ 750,000	$ 525,000

5.2.6.1. Spending by Different Scenarios

The average annual costs spent by each budget scenario for each treatment category is summarised

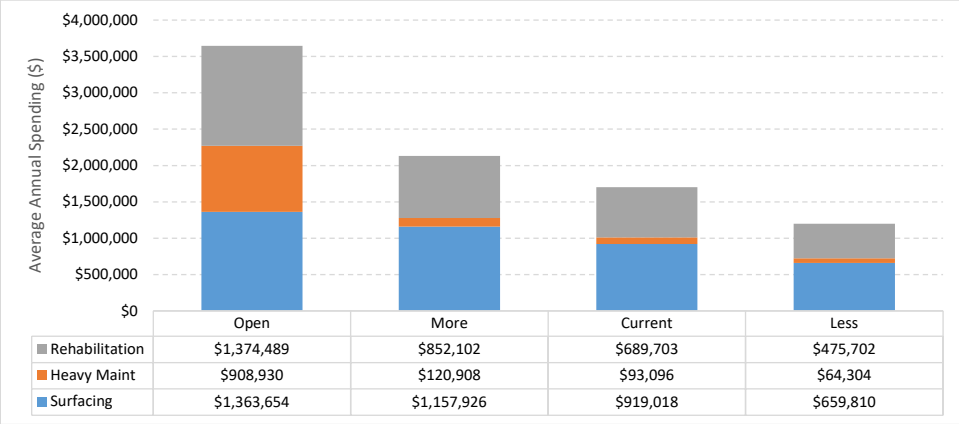
Table 7: Spending by each budget scenario

TREATMENT CATEGORY	OPEN BUDGET	MORE BUDGET	CURRENT BUDGET	LESS BUDGET
Surfacing (Chipseal and ThinAC)	$ 1,363,654	$ 1,157,926	$ 919,018	$ 659,810
Heavy Maintenance	$ 908,930	$ 120,908	$ 93,096	$ 64,304
Rehabilitation	$ 1,374,489	$ 852,102	$ 689,703	$ 475,702
Total	**$ 3,647,073**	**$ 2,130,936**	**$ 1,701,817**	**$ 1,199,816**

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 double the amount of the current budget.

Figure 21 (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 actual spend on resurfacing and heavy maintenance treatment categories are very close to the allowed budget. However, for rehabilitation, the actual spend is often lower than the allowed budget. This is due to long treatment lengths that often cannot be treated within the available budget. Currently 10% of the network length has treatment lengths longer than 1.5 km. A rehabilitation on 1.5 km costs, on average, $450,000 which does not allow another rehabilitation of equal spend amount to be selected in the same year by the Current Budget Category. Further work refining MDC rehabilitation treatment lengths is an improvement task.

Figure 19: Spending by different Budget Scenarios for each Treatment Category



5.2.6.2. Length Treated by Different Scenarios

The length in metres treated by the different budget scenarios are summarised in Table 8: Length treated by each Budget Scenario. Heavy maintenance and rehabilitation are substantially higher in the open budget scenario compared to the constrained budget scenarios.

Table 8: Length treated by each Budget Scenario

	OPEN		MORE		CURRENT		LESS	
	Length	Percentage	Length	Percentage	Length	Percentage	Length	Percentage
Resurfacing	40,464	7.70%	33,603	6.39%	25,432	4.84%	17,791	3.39%
Heavy Maintenance	6,278	1.19%	768	0.15%	646	0.12%	459	0.09%
Rehabilitation	5,079	0.97%	2,813	0.54%	2,147	0.41%	1,537	0.29%

5.2.6.3. Predicted Condition for Different Budget Scenarios

Predicted Surface Condition Index (SCI)

The predicted SCI is shown in Figure 20 for the four alternate budget scenarios. The current budget scenario maintains the SCI at a level of 2 for the first 10 analysis years, but the SCI increases after that to a level of 2.5 towards the end of the analysis period. An increasing trend in SCI indicates the network is deteriorating.

The reason for the increase in the SCI after 2030 is that there is a shift from spending on Chipseal to higher spending on AC, which is a much more expensive treatment; hence lower lengths are treated. The relative budget and treatment quantities for Chipseal and ThinAC for the current budget scenario are shown in

Figure 23. It is clear from this figure that the spending in each year stays constant, but the length treated diminishes from 2030 where a higher proportion of ThinAC treatments are placed.

Figure 20: Predicted SCI for different Budget Scenarios

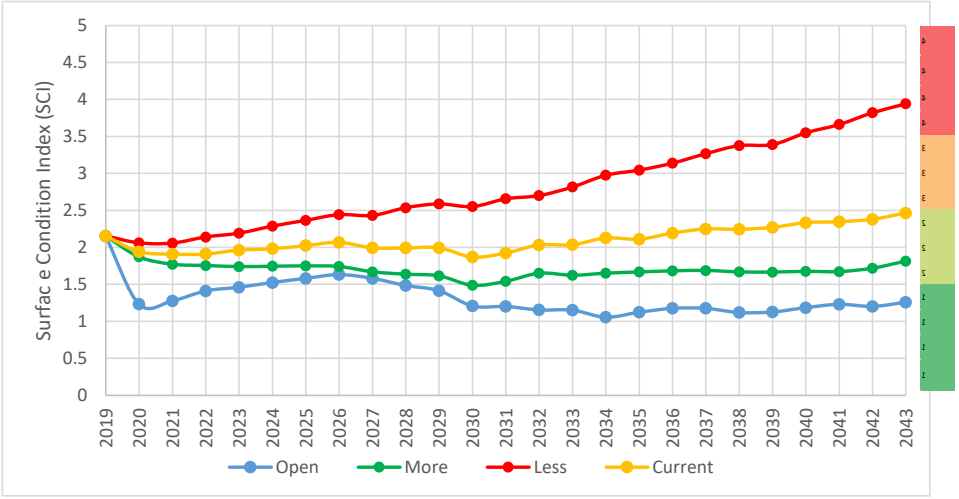
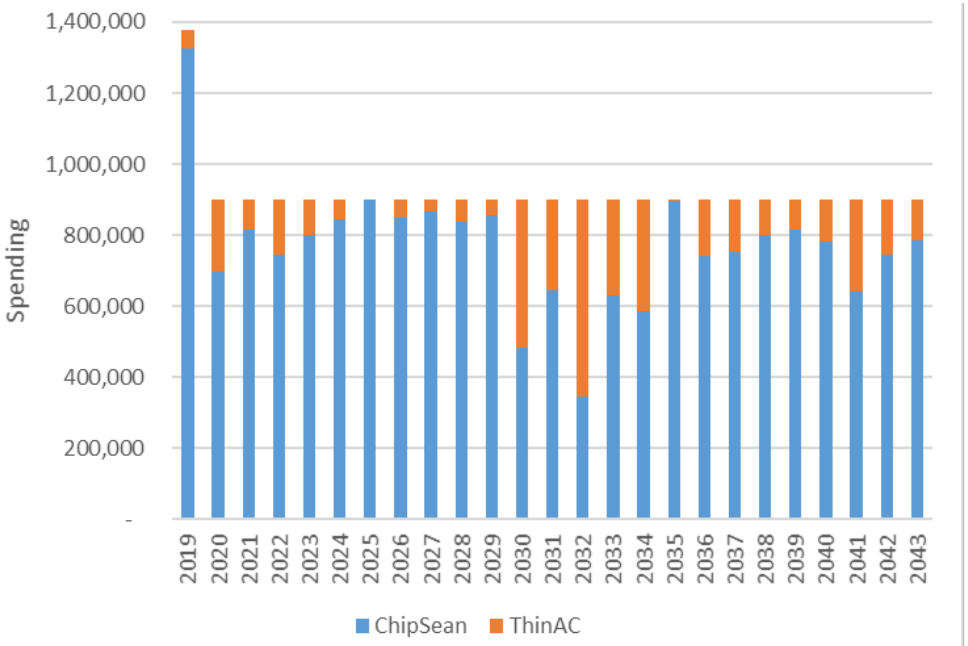
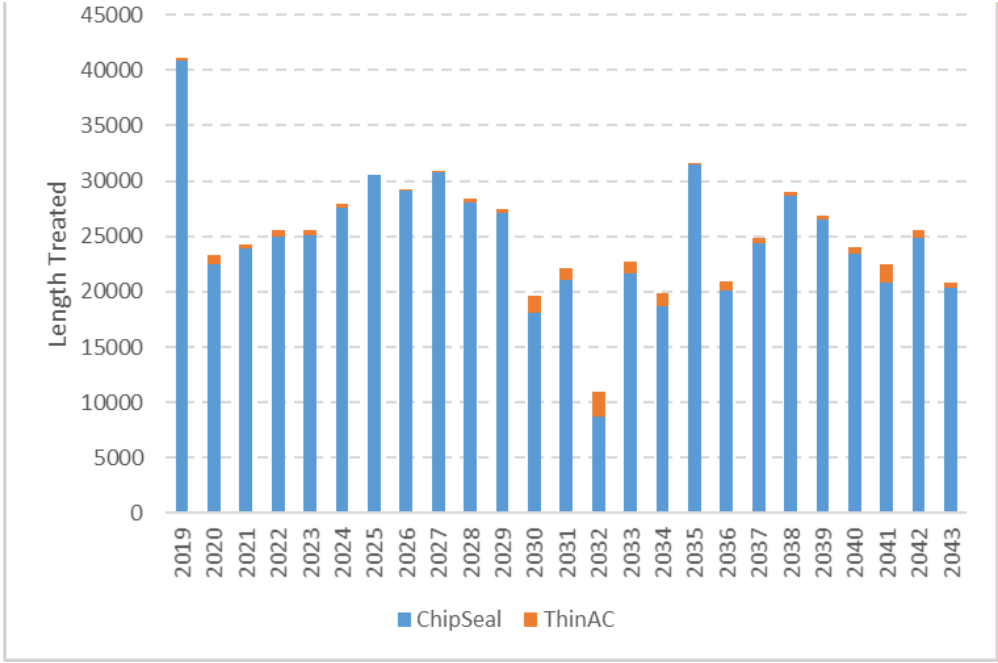


Figure 21: Relative budget and Length Treated for ChipSeal and ThinAC Treatments

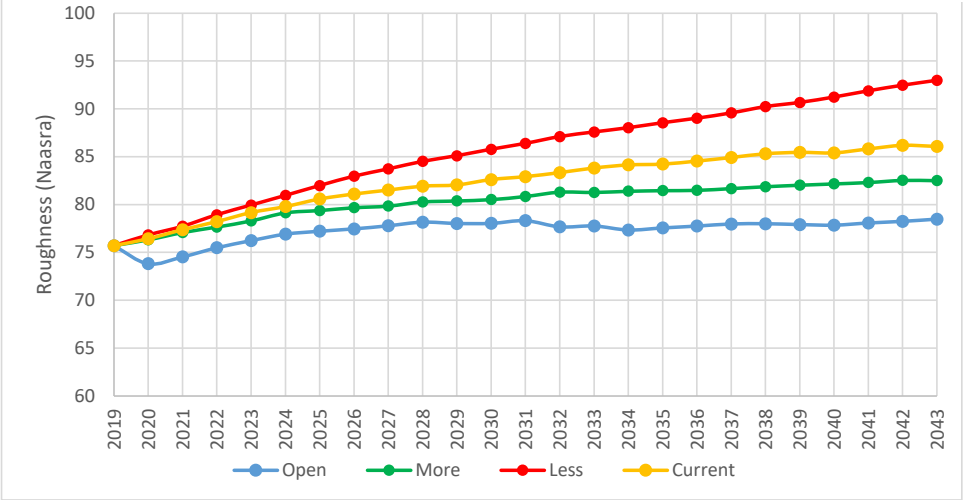




PREDICTED ROUGHNESS

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. An average roughness value of 85 is still regarded as good.

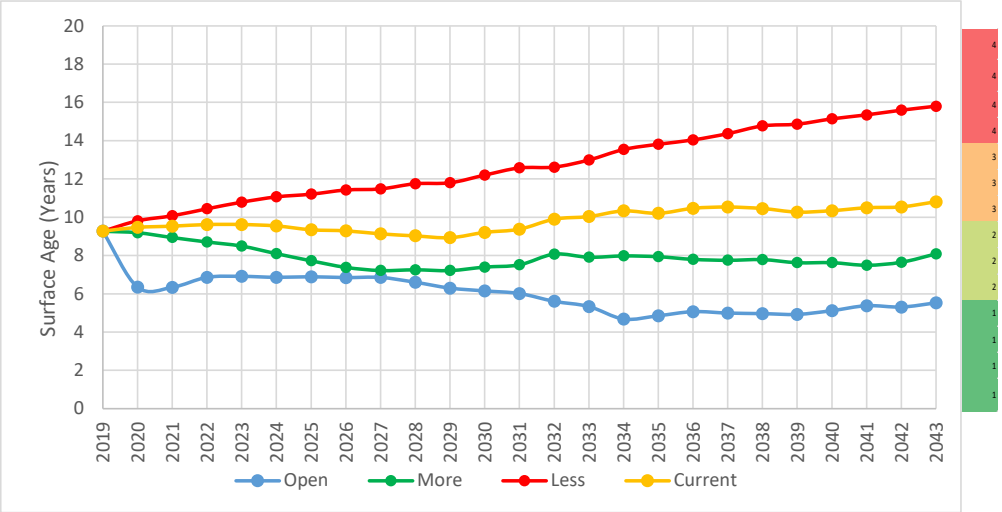
Figure 22: Predicted Roughness for different Budget Scenarios



PREDICTED SURFACE AGE

The current budget scenario can maintain an average surface age of about 10 years. The more budget scenario reduces the average surface age and will help to address the aging and deteriorated network problems raised during the strategic case. As can be expected, the reduction in length treated from 2030 has a slight increase in surface age as a result.

Figure 23: Predicted Surface Age for different Budget Scenarios

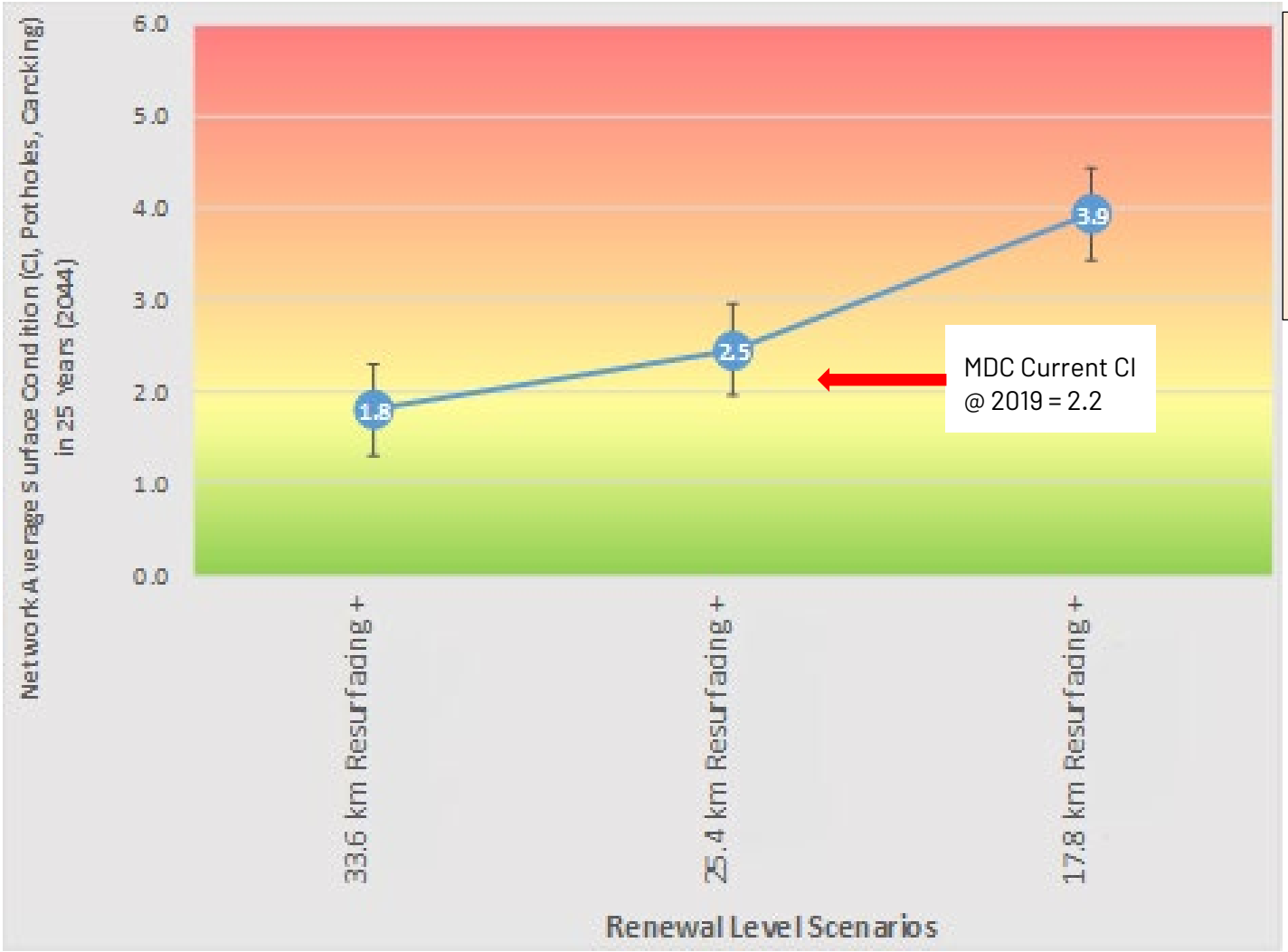


5.2.7. OPTIONS ANALYSIS – SEALED PAVEMENTS

OPTION	ASSESSMENT	ANNUAL COST IMPACT	MCA Criteria Scale 1 2 3 4 5				
			Problem solving effectiveness (weighting 15%)	Benefits community outcomes realised (weighting 30%)	Value for Money (weighting 35%)	Asset preservation and sustainability (weighting 20%)	TOTAL OPTION SCORE (OUT OF 100)
Current status quo (Current)	A programme of maintenance and renewals at the current programme levels is not likely to result in catastrophic failures across the network. However, we will see a continued trend of a deteriorating network with, on average, older surface and pavement life.	W/C 111 +/- $100K W/C 212 +/- $0 W/C 214 +/- $0	3	3	4	3	67
Prioritised treatments 20% (more)	A blended approach using triggers in level of service with minor increases in funding will preserve the asset at the most economic cost to the community.	W/C 111 + $120k W/C 212 + $240K W/C 214 + $225K	4.5	4	3	4	75
Prioritised treatments 20% (less)	Carrying out fewer pavement rehabilitation and reseals will cause significant worsening in both pavement and surface condition. Cracking and rutting would increase. The number of hazardous pavement faults would increase resulting in more crashes.	W/C 111 + $100K W/C 212 - $259K W/C 214 - $213K	2	2	3	1	43
(Open) unconstrained	This option preserves the asset but is expensive and not value for money.	W/C 111 + 900K W/C 212 + $475K W/C 214 + $685K	4.5	4	1	5	65

From the modelled data and multi criteria analysis, it can be concluded that the 'do minimum' status quo resurfacing rate of 4.84% per year is not enough to maintain the current surface condition in terms of surface age and SCI. The more budget scenario, at 20% more than the current budget scenario, performs surfacing on 6.4% of the network length and this renewal rate seems sufficient to maintain the condition of the network.

Figure 24: Long-term return in condition index



From the Return in Condition plot, we can see that any reduction in renewal levels has an impact in higher defects on the networks, and hence higher opex maintenance. This will also result in customer disruptions and have potential safety impacts for the road users.

Table 9: Recommended Long-term renewal levels

WORK CATEGORY	RECOMMENDED RENEWAL INVESTMENT		
	Length (cl.km)/Yr.	%/Yr.	Budget ($,000)/Yr.
Resurfacing (Chip Seal and AC)	30 - 33 km/yr.	6.00%	$1,050 to $1,150
Heavy Maintenance (Isolated AWT)	0.7 - 0.9 km/yr.	0.15%	$100 to $120
Rehabilitation	2.2 - 2.6 km/yr.	0.50%	$890 to $1,050

5.2.8. CDB REJUVENATION

In conjunction with the above, a rejuvenation of a section of CBD is planned in the first year 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 costs below are in addition to the above preferred pavement investment.

Table 10: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 2020 to progress construction, earmarked for early-mid 2021. 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) $1,044,668 W/C 213 (Drainage) $518,043 W/C 214 (Pave Rehab) $220,508 W/C 222 (Traffic Ser) $227,998

5.2.9. 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 11: Financial Impact Sealed Pavements

W/C	DESCRIPTION	IMPACT FROM RESET 2014-19 MAINTENANCE CONTRACT RATES	PREFERRED OPTION COST IMPACT PER ANNUM
111	Sealed Pavement Maintenance	-$200,000	+ $120,000 increase heavy maintenance and for increased renewals program (pre seal repairs)
212	Sealed Road Resurfacing	+$50,000	+$240,000/yr. for an increase in the sealing programme to target poor condition sections and aging network on higher classification roads
214	Sealed Road Pavement Rehabilitation	N/A	+$225,000/yr. for an increase in rehabilitation rates and to address poor condition of some sections network and keep the average age of the pavement from increasing +$221,000/yr1 from CBD rejuvenation year 1 only
113	Routine Drainage Maintenance	See drainage section	+$100,000/yr. to carry higher rate of drainage and shoulders improvements. Impact shown in drainage section

5.2.10. SEALED PAVEMENTS - FINANCIAL SUMMARY EXPENDITURE

Table 12 below summarises the pavement maintenance, renewal and capital works expenditure for the period 2018/21, and the funding request for 2022/24 period.

Table 12: Preferred Programme -sealed pavements - Financial Summary Expenditure

WORK CATEGORY		2018/19 – 2020/21 (APPROVED NZTA PROGRAMME) AVERAGE (PA)	FUNDING REQUEST		
			2021/22	2022/23	2023/24
111	Sealed Pavement Maintenance	$1,062,100	$990,000	$1,022,700	$1,054,400
212	Sealed Road Resurfacing	$1,016,100	$1,316,500	$1,360,000	$1,402,100
214	Sealed Road Pavement Rehabilitation	$924,400	$1,381,400	$1,196,800	$1,233,900

5.2.11. IMPROVEMENTS:

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

1. Improve data quality and investigatory work in pavements

Carry out deflection testing and high-speed data collection 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.

17. Continue to refine and optimise reseal and rehabilitation programme using Juno model and data

Optimise a sustainable level of pavement rehabilitation and reseals using LOS and data as triggers for treatment to minimise whole of life pavement costs. This will manage average condition and age of the network with a continued focus on ONRC categories and haulage roads. Refine model in field and update treatment lengths.

5.3. UNSEALED PAVEMENTS

Work Categories: 112 Unsealed Pavement Maintenance, 211 Unsealed Road Metaling (Associated activities: 113 Routine Drainage Maintenance & 213 Drainage Renewals)

5.3.1. Introduction

While vehicle volume on unsealed roads is limited, it still plays a major part in keeping the regions' economy moving, and as such the importance of a functional unsealed network is high.

The unsealed network also suffers from the sealed networks' topology, geology, forest harvesting and rainfall vulnerabilities of which, under certain

conditions, can leave access to parts of the network limited, or during major weather events, non-existent.

Although these roads in Masterton are typically classified as low volume as per ONRC, there is an expectation that they are:

- Fit for purpose
- Safe and trafficable: "no surprises"
- Provide a reasonable and consistent ride
- Economical in maintenance
- Maintained to exceed the design life
- Not a nuisance (excessive dust) to our customers

The unsealed roads metalling is made up of three items:

- Adding new metal to unsealed roads, reshaping it and compacting
- Adding a stabilised pavement to unsealed roads
- Adding wearing course to the newly stabilised pavements

5.3.2. STRATEGIC CASE LINKAGE – UNSEALED

WORK CLASS (W/C)	PROBLEM /OPPORTUNITY	BENEFITS OF PROPOSED ACTIVITY	LINKAGE TO STRATEGIC COMMUNITY AND GPS PRIORITY	CONSEQUENCES
112 Unsealed Pavement Maintenance 211 unsealed Road Metalling	Aging and deteriorating network Safety Affordability	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.	A system that is safe, resilient and addresses current and future demand for access to economic and social opportunities.	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.

5.3.3. 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 5 Evidence and Gap Analysis provides evidential support to this.

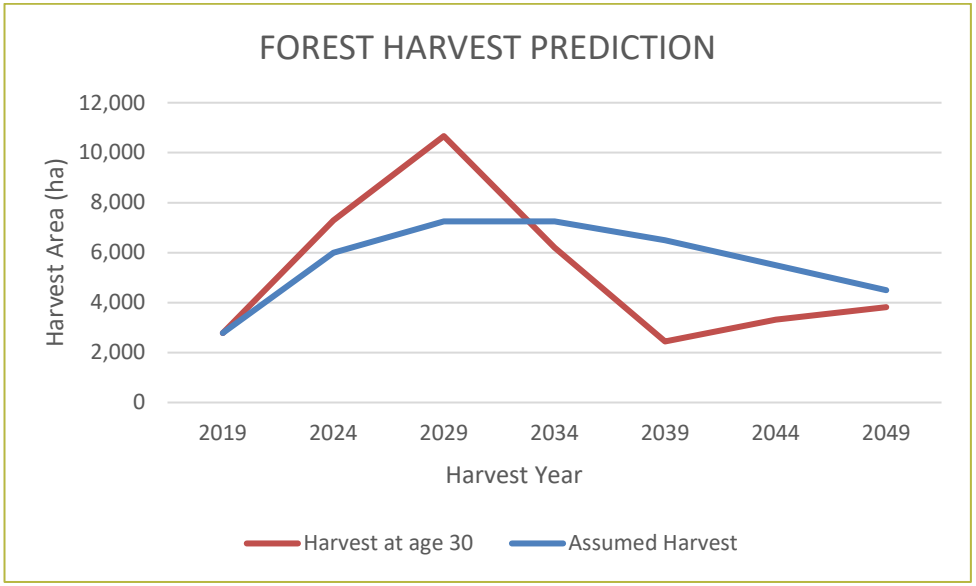
The council has 279 km of unsealed roads and historically (six-year average) the approximate expenditure for maintenance and metalling is $437,000

p.a. and $774,000 p.a. respectively. This equates to an annual cost per Km of $1569 for maintenance and $2775 for metalling. The comparative figure nationally is approximately $1150 and 2250 respectively per Km, see Table 5 Evidence and Gap Analysis.

5.3.4. 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 25: Projected Forestry Harvest Area. 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 25: 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.

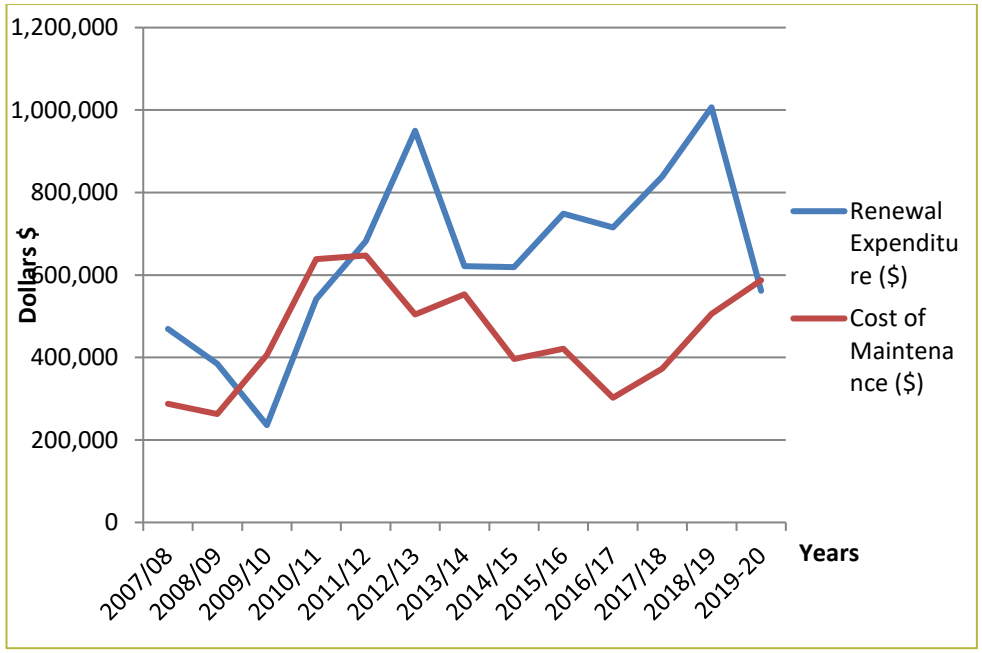
The roads associated with the main forest areas also serve other farming activities, tourism traffic and some lifestyle properties. If roads are not strengthened, or continuously maintained, there can be a severe reduction in the level of service. This is particularly evident in the winter months and 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 26: Historical Expenditure Unsealed Roads illustrates that MDC has successful reduced maintenance expenditure during the period between 2012 to 20113 however expenditure has recently increased

Figure 26: 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 27: Projected Forestry Harvest Area

5.3.5. OPTIONS ANALYSIS – UNSEALED

OPTION	ASSESSMENT	ANNUAL COST IMPACT	MCA Criteria Scale 1 2 3 4 5			
			Benefits Realised (50%)	Value for Money (30%)	LOS Impact (20%)	MCA Score (out of 100)
Little to no heavy metalling	Assume that the long-term maintenance costs double. The unsealed road condition will also deteriorate with potholing and corrugation becoming more common. Some roads becoming impassable in winter due to lack of metal (clay punchouts). More wet, roll and grades required to maintain shape.	W/C 112: +$1,220K W/C 211: -$640K W/C 140: +$200K	1	3	2	**36**
Routine metalling and maintenance	Reactive routine maintenance, grading and metalling. Wet, roll and grade.	W/C 112: $0 W/C 211: -$200K W/C 140: +$200K	3	4	2	**62**
Target forestry routes for stabilising and strengthening roads with higher LOS maintenance metalling	Target forestry harvesting routes and carry out a programme of stabilising and strengthening unsealed pavements on identified sections where there is heavy logging activity (2.0km/annum). W/C 112 expenditure is expected to further decrease at year 10, by 30% due fewer pothole and corrugations. Also, much less likely to require wet, roll and grades.	W/C 112: -$30K increasing to -$265K by Year 10 W/C 211: +$300K W/C 113 & 213: +$50K & +$80K	4	3	4	**74**
Drainage Improvements	Cleaning/reinstating surface water tables – assume 10 years average cycle time for all rural roads and 5-year cycle time for forestry and collector routes. Improve drainage when rehabilitating pavements - assume 10% reduction in unsealed maintenance costs.	W/C 112: -$300@ y10 W/C 211: +$300,000 W/C 113 & 213: +$100K & +$80K	4	3	3	**70**

PREFERRED OPTIONS – Target forestry routes for stabilising and strengthening roads with higher LOS maintenance metalling. This option will target the highest risk roads with forestry traffic at an increased estimated cost of $300,000/year. Improve drainage when carrying out associated works on unsealed pavements.

5.3.6. 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	IMPACT FROM RESET 2018 MAINTENANCE CONTRACT RATES	PREFERRED OPTION COST IMPACT PER ANNUM
112	Unsealed Pavement Maintenance	+$60,000	-$30,000 in year 1 rising to -$265,000 at year 10 following targeted pavement strengthening programme
211	Unsealed Road Metalling	-$200,000 reduction in metal cost	+$300,000 /yr. for an increased programme of strengthening and wearing course application to continue renewal program
113	Routine Drainage Maintenance	See drainage section	+$50,000/yr. to carry higher rate of drainage and shoulders improvements. Impact shown in drainage section shown in
213	Drainage renewals	See drainage section	+$80,000/yr. to carry increased drainage renewals in parallel with pavement improvements. Impact shown in drainage section shown in

5.3.7. UNSEALED - FINANCIAL SUMMARY EXPENDITURE

Table 13 below summarises the unsealed maintenance and renewal expenditure for the period 2018/21, and the funding request for 2022/24 period.

Table 13: Preferred Programme -Unsealed - Financial Summary Expenditure

WORK CATEGORY		2018/19 – 2020/21 (APPROVED NZTA) AVERAGE (PA)	FUNDING REQUEST		
			2021/22	2022/23	2023/24
112	Unsealed Pavement Maintenance	$576,100	$610,900	$631,100	$650,700
211	Unsealed Road Metalling	$792,800	$1,035,000	$1,069,200	$1,102,300

5.3.8. IMPROVEMENTS:

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

- Testing of aggregate

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

5.4. DRAINAGE

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

5.4.1. 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.

5.4.2. STRATEGIC CASE LINKAGE - DRAINAGE

WORK CLASS (W/C)	PROBLEM /OPPORTUNITY	BENEFITS OF PROPOSED ACTIVITY	LINKAGE TO STRATEGIC COMMUNITY & GPS PRIORITY	CONSEQUENCES
113 213	Our roads are vulnerable to flooding and slips which limits access and makes the network less resilient. Roads that have inadequate maintenance of side drains and culverts can lead to premature deterioration of the pavement, and reduction in road widths by slips and dropouts.	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	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.

5.4.3. 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. The cost to maintain Masterton drainage system is less than the peer group average; Table 5 Evidence and Gap Analysis provides evidential support to this.

5.4.4. 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.

The decision to renew the kerb and channel is determined by detailed visual inspection and maintenance cost analysis. Stormwater programmes are aligned with the carriageway and footpath programmes to achieve operational efficiency and ensure a logical sequence of renewal of these related asset types. MDC always plan to renew storm water assets, where possible, to meet environmental outcomes.

Other drainage assets are considered for renewal when associated assets are being programmed for resurfacing or rehabilitation. 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.

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.

Approximately 200m of culverts, 400m of urban Kerb and Channel and 50km high shoulder/SWC are programmed each year.

5.4.5. OPTIONS ANALYSIS - DRAINAGE

OPTION	ASSESSMENT	ANNUAL COST IMPACT	MCA Criteria Scale 1 2 3 4 5				TOTAL OPTION SCORE (OUT OF 100)
			Benefits realised (weighting 20%)	Value for Money (weighting 40%)	Closing Customer and Technical LoS (weighting 15%)	Asset preservation and sustainability (weighting 25%)	
No drainage renewals	Carry out only routine drainage maintenance work. Drainage systems will fail and block over time and lead to pavement failure and wash outs/slips during heavy rain. Assume 20% increase for pavements.	W/C 113 & 213: +$0 & -$250,K	1	2	2	1	31
ONRC Programme of drainage maintenance and renewals (LOS adjustment)	Programme renewals of drainage systems based on condition, with a focus on upgrading systems that are under capacity, particularly on main arterials and collectors or where there is a change of use. This would include addressing surface water tables and side drains in rural areas where water is entering pavements and also replacing broken or undersized culverts.	W/C 113: +$50K W/C 213: +$100K	3	3	4	4	68
Reduced maintenance with programme of renewals (blending)	Carry out routine drainage works such as cleaning culverts on a reactive basis. Limited surface water table maintenance. Drainage renewals carried out mainly in conjunction with rehabilitation projects and reseals.	W/C 113: -$0 W/C 213: -$0	2	4	2.5	3	63

PREFERRED OPTIONS –Carry out a programme to remove high shoulders and reinstate surface water tables, with an 8 years average cycle time for all rural roads, and 5-year cycle time for forestry and collector routes (or 50km of SWC/annum). Focus should be first on sealed roads that are being resurfaced and rehab sites. Carry out an annual programme of concrete kerb and channel renewals, assuming 100-year life (or 200m of concrete K&C replaced per annum).

5.4.6. 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	IMPACT FROM RESET 2018 MAINTENANCE CONTRACT RATES	PREFERRED OPTION COST IMPACT PER ANNUM
113	Routine Drainage Maintenance	+$20,000	+$50,000/yr. to carry higher rate of drainage and shoulders maintenance
213	Drainage Renewals	+/-$0	+$100,000/yr. increased programme renewals of drainage systems based on condition +$518,000/yr1 from CBD rejuvenation year 1 only

5.4.7. DRAINAGE - FINANCIAL SUMMARY EXPENDITURE

Table 14 below summarises the Drainage maintenance, renewal and capital works expenditure for the period 2018/21, and the funding request for 2022/24 period.

Table 14: Preferred Programme -Drainage - Financial Summary Expenditure Table

WORK CATEGORY		2018/19 – 2020/21 (APPROVED NZTA) AVERAGE (PA)	FUNDING REQUEST		
			2021/22	2022/23	2023/24
113	Routine Drainage Maintenance	$493,300	$567,800	$586,600	$604,800
213	Drainage Renewals	$402,700	$1,028,900	$523,500	$539,700

5.4.8. 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, so a more informed programme of works can be delivered.

5.5. STRUCTURES: BRIDGES, LARGE CULVERT & RETAINING STRUCTURES

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

5.5.1. 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.

5.5.2. STRATEGIC CASE LINKAGE - STRUCTURES

WORK CLASS (W/C)	PROBLEM /OPPORTUNITY	BENEFITS OF PROPOSED ACTIVITY	LINKAGE TO STRATEGIC COMMUNITY & GPS PRIORITY	CONSEQUENCES
114 215 341	Maintenance: Continued maintenance and component replacement required to ensure assets perform as designed. Accessibility: 23.5% of the network is inaccessible to Class1 or larger vehicles, due to restricted bridges. However not all routes are required to have Class 1 access. Programme should target structures on routes where greater capacity is required in a logical manner. deteriorated retaining walls will create resilience issues and exacerbate affordably problems.	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	Structures will deteriorate over time leading to restrictions to freight movement and increasing risk of bridge or retaining wall failure resulting in safety issues and complete loss of access.

5.5.3. 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.

5.5.3.1. 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.

5.5.4. 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.

5.5.5. 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.

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.

Bridge component renewals and bridge and structures replacements have been identified and programmed across the next 30 years. Key programmed works proposed during the next three funding block include:

- Colombo Road Bridge (year 1, late change to Waka Kotahi Funding model now includes this in 216 Bridge renewals as part of MOR)
- Te Mara (year 2, funded as renewal within the MOR funding)

- Tauweru Bluffs retaining wall

Te Mara -Condition based on renewal end of life economic case and prevent value saving, no alternative access). Tauweru Bluffs retaining wall - end of life and failed, 4m high 30m long wall, embedded into bank, tieback timber/steel wall. Colombo Road Bridge - Routine inspections of the structure have identified an issue with river bed degradation exposing the piles and further investigation showed there was inadequate pile depth compromising the structural integrity of the bridge. In conjunction with the age of the structure and its overall condition, the most economic solution is the replace the structure.

Any major works carried out on a structure, or if a structure is replaced will be designed to carry HPMV loads.

There are a couple of low volume bridges that may need replacement in the next 30 years (McGruddys and Grahams) but there may be better economical alternatives to their replacement. 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

5.5.6. 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.

5.5.7. OPTIONS ANALYSIS - STRUCTURES

OPTION	ASSESSMENT	ANNUAL COST IMPACT	MCA Criteria Scale 1 2 3 4 5				TOTAL OPTION SCORE (OUT OF 100)
			Benefits realised (weighting 40%)	Value for Money (weighting 30%)	Closing Customer and Technical LoS (weighting 10%)	Asset preservation and sustainability (weighting 20%)	
Routine maintenance structural work where required	Routine maintenance and structural component replacement where required to maintain assets in their current condition. Limited bridge replacement.	W/C 114: +$30,000 W/C 215: $0	3	4	3	3	66
No structural work	Assume long term maintenance costs would double. This option is not practical as there are structures and components due for replacement over the next 10-20 years. This option would see weight restrictions on numerous bridges and would greatly increase the risk of catastrophic failure.	W/C 114: +$50,000 W/C 215: -$-80,000	1	2	2	1	28
Replace aging compromised structures. Removal of weight and 50Max restrictions	Look to strengthen one bridge on freight route (list bridges) to allow HPMV access This option would be confirmed by undertaking detailed 50MAX and HPMV assessments for these bridges.	W/C 114: +$25,000 W/C 216: $2,900,000 W/C 341: Upgrade cost when need identified	5	2	2	3	68

PREFERRED OPTION - Continue maintenance 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 to further developed routes compatible with economic accessibility.

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

W/C	DESCRIPTION	IMPACT FROM RESET 2018 MAINTENANCE CONTRACT RATES	PREFERRED OPTION COST IMPACT PER ANNUM
114	Structures Maintenance	Nil	+ $25,000
215	Structural Component Replacement	Nil	+/- $0
216	Structural Renewals (Bridge & Retaining Walls)	Nil	Allow for 2.8mil year 1 and 2 & $200k year 2 to replace 2 bridges, and $200k year 2 respectively for renewing a retaining wall.
341	Low Cost/Low Risk Improvements	N/A	Cost to be identified based on need – potentially $500,000 in any one year

5.5.8. STRUCTURES - FINANCIAL SUMMARY EXPENDITURE

Table 15 below summarises the structures maintenance, renewal and capital works expenditure for the period 2018-21, and the funding request for 2022-24 period.

Table 15: Preferred Programme -Structures - Financial Summary Expenditure

WORK CATEGORY		2018/19 – 2020/21 (APPROVED NZTA) AVERAGE (PA)	FUNDING REQUEST		
			2021/22	2022/23	2023/24
114	Structures Maintenance	$107700	$133,800	$138,200	$142,500
215	Structural Component Replacement	$142,500	$143,600	$148,300	$152,900

216	Structural Renewals	Nil	$1,700,000	$1,708,300	$16,100

5.5.9. IMPROVEMENTS:

Improvements that should be considered during the 2021/24 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.

5.6. ENVIRONMENTAL AND MINOR EVENTS

121 Environmental Maintenance and 140 Minor Events

5.6.1. 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.

5.6.2. STRATEGIC CASE LINKAGE – ENVIRONMENTAL / MINOR EVENTS

WORK CLASS (W/C)	PROBLEM /OPPORTUNITY	BENEFITS OF PROPOSED ACTIVITY	LINKAGE TO STRATEGIC COMMUNITY AND GPS PRIORITY	CONSEQUENCES
121 140	A well-managed environmental and minor events programme will result in	Sightlines and roadside hazards will be minimized	The environmental/minor events activity is part of the package and other activities rely on the delivery of activity.	Negative customer perception of Masterton. Environmental pollution. Sightlines affected with increased

	decreased costs and positive environmental & safety outcomes.	therefore improving road safety.	Non-delivery of proposed activity may impact negatively on benefits realisation of resilience, safety and access	hazards in the road corridor and a higher risk of fatal and serious injuries.

5.6.3. CURRENT CONDITION AND PERFORMANCE

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

5.6.4. 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.

5.6.5. OPTIONS ANALYSIS - ENVIRONMENTAL / MINOR EVENTS

OPTION	ASSESSMENT	ANNUAL COST IMPACT	MCA Criteria Scale 1 2 3 4 5				TOTAL OPTION SCORE (OUT OF 100)
			Benefits realised (weighting 20%)	Environmental impacts (weighting 15%)	Value for Money (weighting 50%)	Closing Customer and Technical LoS (weighting 15%)	
Blended programme	Carry out same LOS mowing and spraying. Limited tree removal over the next three years. Increase litter removal through more resources in the maintenance contract and status quo spraying, mowing and vegetation trimming and high cut programme. Tree trimming by boom mounted mulcher on freight, tourist and arterial routes –3 yearly cycle (or 160km/annum). Continue current allocation for any minor events that effect the carriageway	W/C 121: $80K W/C 140: $0	3	3	4.5	3	75
Enhanced programme	As above with blended programme but continue to target high risk tree removal on high volume routes.	W/C 121: +$180K W/C 140: $0	4	3	3	4	67

PREFERRED OPTIONS –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. Continue to monitor the effectiveness of the current funding allocation for any minor events that effect the carriageway.

5.6.6. 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	IMPACT FROM RESET 2018 MAINTENANCE CONTRACT RATES	PREFERRED OPTION COST IMPACT PER ANNUM
121	Environmental Maintenance	- $20000	+$80,000
140	Minor Events	NA	No change

5.6.7. ENVIRONMENTAL - FINANCIAL SUMMARY EXPENDITURE

Table 16 below summarises the Environmental maintenance and renewal expenditure for the period 2018/21, and the funding request for 2022/24 period.

Table 16: Preferred Programme -Structures - Financial Summary Expenditure Table

WORK CATEGORY		2018/19 – 2020/21 (APPROVED NZTA) AVERAGE (PA)	FUNDING REQUEST		
			2021/22	2022/23	2023/24
121	Environmental Maintenance	$573,600	$658,800	$680,500	$701,600
140	Minor Events	$176,600	$191,500	$197,800	$204,000

5.6.8. IMPROVEMENTS:

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

- None identified

5.7. TRAFFIC SERVICES

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

5.7.1. 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.

5.7.2. STRATEGIC CASE LINKAGE – TRAFFIC SERVICES

WORK CLASS (W/C)	PROBLEM /OPPORTUNITY	BENEFITS OF PROPOSED ACTIVITY	LINKAGE TO STRATEGIC COMMUNITY & GPS PRIORITY	CONSEQUENCES
122 222	Our current delineation across parts of the network do not comply with the accepted standards for the road type. Deficiencies include pavement markings (edge lines), edge marker posts delineation and inconsistent curve warning signage (particularly on arterial and collector roads). This will be contributing to the increasing trend of fatal and serious injury crashes in Masterton. Direction signage and road lighting is considered acceptable to meet the current needs of the network.	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.	Loss of control crashes will continue, increasing the risk of fatal and serious injury.

5.7.3. 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 5 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.

5.7.4. 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.

5.7.5. OPTIONS ANALYSIS - TRAFFIC SERVICES

OPTION	ASSESSMENT	ANNUAL COST IMPACT	MCA Criteria Scale 1 2 3 4 5 Community Outcomes Achieved (weighting 15%)	Problem solving effectiveness (weighting 20%)	Benefits realised (weighting 350%)	Closing Customer and Technical LoS (weighting 30%)	TOTAL OPTION SCORE (OUT OF 100)
Status quo	Continue a programme of maintenance and delineation replacement. Current resourcing levels are ineffective at maintaining compliance with part 5 of the traffic control and devices standard. Embark on some work on replacing broken edge marker posts but much more is required. Full annual line re-mark.	W/C 122: +$0 W/C 222: +$30,000	2.5	2	1	2	35
Implement delineation strategy	In addition to option status quo – provide an enhanced programme of completing new roading markings, edged marker posts and curve signage to ensure a consistently compliant network. Increased housekeeping and maintenance of current assets.	W/C 122: $0 W/C 222: -$30K increasing to +$230K at six years W/C 341: -$200,000 per yr.	4	3	4	3	76

PREFERRED OPTIONS – Continue full annual line re-mark with enhanced delineation upgrade programme with an associated increase cost in maintenance, upgrade work to include:

- Painted markings and RRPM's
- Edge marker posts
- Curve signage

The painted markings and RRPM's are more appropriately installed as a continuous operation which will provide uniformity. Major routes will be completed as a priority.

The EMP's are the next priority works. With the major routes to be completed first, followed by the other sealed roads then unsealed roads. This will be further prioritised into access and low volume roads to allow the required funding needed to complete the works, distributed over the six-year programme to be funded under the low-cost low risk programme.

The curve signage is the third major priority due to the extent of existing signage already addressing the most severe corners. The work will be prioritised as per the EMP upgrade. A further $228k of traffic services maintenance funding is required annually to maintain the additional delineation installed.

This programme of work is expected to reduce the likelihood of loss of control crashes resulting in fewer deaths and serious injuries.

5.7.6. 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	IMPACT FROM RESET 2018 MAINTENANCE CONTRACT RATES AND LED CONVERSION	PREFERRED OPTION COST IMPACT
122	Traffic Services Maintenance	+/-$0 -$80,000	+$10,000 per annuum Increasing to $50,000 over 6 years due to delineation improvements
222	Traffic Services Renewals	+ $20,000 /yr.	+$30,000 per annuum Increasing to $230,000 over 6 years due to delineation improvements +$227,998/yr1 from CBD rejuvenation year 1 only
341	LCLR		+ $200,000 /yr. over 6 years

5.7.7. TRAFFIC SERVICES - FINANCIAL SUMMARY EXPENDITURE

Table below summarises the Drainage maintenance, renewal and capital works expenditure for the period 2018/21, and the funding request for 2022/24 period.

Table 17: Preferred Programme -Traffic Services - Financial Summary Expenditure

WORK CATEGORY		2018/19 – 2020/21 (APPROVED NZTA) AVERAGE (PA)	FUNDING REQUEST		
			2021/22	2022/23	2023/24
122	Traffic Services Maintenance	$162,700	$163,900	$200,600	$271,300
222	Traffic Services Renewals	$561,900	$856,600	$682,200	$753,500

5.7.8. IMPROVEMENTS:

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

- To implement stages of the delineation strategy

5.8. WALKING AND CYCLING

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

5.8.1. 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.

5.8.2. STRATEGIC CASE LINKAGE – WALKING AND CYCLING

WORK CLASS (W/C)	PROBLEM /OPPORTUNITY	BENEFITS OF PROPOSED ACTIVITY	LINKAGE TO STRATEGIC COMMUNITY & GPS PRIORITY	CONSEQUENCES
124 125 342	Further work is required to connect the key cycleway routes to schools, parks and businesses to enable the full vision of the cycleway network to be realised. This should be supported by travel planning. Our footpaths are deteriorating due to lack of historical renewals which has led to increased risk of trip hazards and obstructions, particularly with an aging population who are becoming less mobile and are requiring wider footpaths and crossings that are suitable for mobility scooters and wheelchairs.	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	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.

5.8.3. 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 annuum and the construction of the new shared paths with time we hope to see this increase. Table 5 Evidence and Gap Analysis provides evidential support to this.

5.8.4. 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.

5.8.5. OPTIONS ANALYSIS – WALKING AND CYCLING

OPTION	ASSESSMENT	ANNUAL COST IMPACT	MCA Criteria Scale 1 2 3 4 5				
			Community Outcomes Achieved (weighting 15%)	Problems Solving effectiveness (weighting 15%)	Value for Money (weighting 30%)	Closing Customer and Technical LoS (weighting 40%)	TOTAL OPTION SCORE (OUT OF 100)
Reduce footpath renewals - no cycle improvements	Reduce the amount of renewals per annum, assume increase maintenance costs of 20% and increased complaints. No new construction of cycle paths.	W/C 124: +$50K W/C 225:-$100K	1	1	2.5	2	38
Current programme of footpath renewals - incremental cycling improvements where possible (status quo)	Continue to deliver the programme of footpath renewals based on condition. Install and improve facilities fit for mobility scooter use and small cycling projects to improve safety. This option would replace footpaths on 8km/yr. and use the LCLR programme to delivery new footpath and cycling safety improvements.	W/C 124: +$0 W/C 125: + $0 W/C 225: -$0 W/C 341: +$30K	2.5	3	4	2.5	64
Current programme with improvements to walking and investigation/detail design of cycling projects such as separated routes, lanes and shared paths	Continue current footpath renewal programme and develop cycle friendly designs to provide safer connections to schools, sports fields and businesses. Work towards realizing the cycling strategy and encourage mode shift.	W/C 124: +$0 W/C 125: +$0 W/C 225: -$0 W/C 341: +$70K	4	4.5	3	4	74

PREFERRED OPTIONS – Continue to deliver the current renewal rate of footpaths over the next 6 years. This level of investment is still considered appropriate to deliver on desired outcomes and maintain LOS going forward.

Proposed investment to facilitate MDC strategic direction for active transportation over the next 3-year period, with investigation and detailed design options for safer, active transport options around key school routes.

5.8.6. 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	IMPACT FROM RESET 2018 MAINTENANCE CONTRACT RATES	PREFERRED OPTION COST IMPACT PER ANNUM
124	Cycleway Maintenance	+/- $0	+/- $0
125	Footpath Maintenance	+ $20,000 /yr.	+ $40,000 +$1,045,000/yr1 for CBD rejuvenation year 1 only
225	Footpath Renewals	+/-$0	+/-$0
341	Low Cost/Low Risk Improvements	N/A	+/- $70,000 /yr. impact shown in LCLR.

5.8.7. WALKING AND CYCLING - FINANCIAL SUMMARY EXPENDITURE

Table 18 below summarises the Walking and cycling maintenance, renewal and capital works expenditure for the period 2018/21, and the funding request for 2022/24 period.

Table 18: Preferred Programme -Walking & Cycling - Financial Summary Expenditure

WORK CATEGORY		2018/19 – 2020/21 (APPROVED NZTA) AVERAGE (PA)	FUNDING REQUEST		
			2021/22	2022/23	2023/24
124	Cycleway Maintenance	$5,200	$10,100	$10,400	$10,700
125	Footpath Maintenance	$485,000	$66,500	$67,700	$69,800
225	Footpath Renewals		$1,574,600	$555,000	$557,200

5.8.8. IMPROVEMENTS:

Improvements that should be considered during the 2021/23 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.

5.9. NETWORK AND ASSET MANAGEMENT

151 Network and Asset Management

5.9.1. 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.

5.9.2. STRATEGIC CASE LINKAGE – NETWORK AND ASSET MANAGEMENT

WORK CLASS (W/C)	PROBLEM /OPPORTUNITY	BENEFITS OF PROPOSED ACTIVITY	LINKAGE TO STRATEGIC COMMUNITY & GPS PRIORITY	CONSEQUENCES
151	Affordability: The cost of management and resourcing the roading department, and the extent and cost of network inspections has increased under current contract rates and operational restrictions. Requirements and expectations for more accurate and reliable data management is important when looking to realise transport outcomes.	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.	Poor data quality, shortages of appropriately qualified staff, lack of competition in the market and potentially poorer quality workmanship and contract outcomes.

5.9.3. CURRENT CONDITION AND PERFORMANCE - NETWORK AND ASSET MANAGEMENT

The cost of network and asset management is similar when compared to the peer group average, suggesting that Masterton is performing well with its professional service, even with increasing costs in contract management. Urgent customer service requests are being responded to within the LTP timeframes; non urgent service request timeframes could be improved on. Table 5 Evidence and Gap Analysis provides evidential support to this.

5.9.4. 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.

5.9.5. OPTIONS ANALYSIS – NETWORK AND ASSET MANAGEMENT

OPTION	ASSESSMENT	ANNUAL COST IMPACT	MCA Criteria Scale 1 2 3 4 5				TOTAL OPTION SCORE (OUT OF 100)
			Problem Solving Effectiveness (weighting 30%)	Community Outcomes Achieved (weighting 20%)	Value for Money (weighting 30%)	Closing Customer and Technical LoS (weighting 20%)	
Reduce data collection	Network outcomes would be unable to be forecasted and programmes modelled. Missing or poor data quality would lead to uninformed engineering options being considered and a probable increased cost for all work categories.	W/C 151: -$100K	3	2	4	2	58
Meet requirements for data collection with improved relationships and services within maintenance contract and with neighbouring council	Continue to deliver professional services and management at current level of service with incremental improvement to relationship contracts and management. Continue the current level of data collection, but where possible, look for innovative ways to improve our methods in this area, and include additional data collection such as FWD to enhance modelling of the network.	W/C 151: +$50K	4	3	3	4	70

PREFERRED OPTIONS –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.

5.9.6. 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	IMPACT FROM RESET 2018 MAINTENANCE CONTRACT RATES	PREFERRED OPTION COST IMPACT PER ANNUM
151	Network and Asset Management	+ $165,000	+50,000

5.9.7. NETWORK AND ASSET AND MANAGEMENT - FINANCIAL SUMMARY EXPENDITURE

Table 19 below summarises the Network and asset management expenditure for the period 2018/21, and the funding request for 2022/24 period.

Table 19: Preferred Programme -Network and Asset Management - Financial Summary Expenditure

WORK CATEGORY		2018/19 – 2020/21 (APPROVED NZTA) AVERAGE (PA)	FUNDING REQUEST		
			2021/22	2022/23	2023/24
151	Network and Asset Management	$1,020,900	$1,245,800	$1,286,900	$1,380,500

5.9.8. IMPROVEMENTS:

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

- Further develop opportunities with contractual relationships and use of shared services with adjoining Councils.
- Improve RAMM data collection and quality and Juno LOS data for deterioration models for asset programming.

5.10. LOW COST LOW RISK (LCLR)

341 Low Cost/Low Risk

5.10.1. INTRODUCTION

This work category provides for the construction/implementation of low-cost/low-risk improvements to the transport system to a maximum total cost for approval per project of $2,000,000.

Examples of qualifying activities include:

- Small, isolated geometric road and intersection improvements
- Traffic and speed calming measures
- Lighting improvements for safety
- Sight benching to improve visibility
- Projects that improve resilience within the network
- Walking and cycling facilities
- Bridge upgrades
- Minor engineering works associated with community programmes

All funding applications need to show alignment with strategic priority outcomes stated in the Government Policy Statement.

Additional information about location and benefit and strategic priority is a requirement. This is to help with tracking of investment against the delivery of GPS priorities, and on closing gaps in customer level of service.

The following additional information is a prerequisite requirement for all LCLR activities:

- **Individually listed projects** – To clarify what is included in the LCLR programme
- **GPS alignment** – The GPS strategic priority that best aligns will need to be stated for each individual activity
- **Activity location information** – Needs to be provided for each individual activity to allow benefits mapping to be undertaken across the LCLR programme
- **Benefits** – These need to be identified for each LCLR activity. This will allow benefit measurement to be undertaken

Masterton has historically spent approximately $800k per annum on minor improvement projects. The funding has helped to deliver a number of key projects, providing positive benefits to our community and contributing to safety benefits for Masterton.

Council sees the increased funding amount in the order of $2 million as an opportunity to proactively continue to address issues highlighted in our Problem Statements, particularly around safety. The increased fund would be required for this 3-year programme, the reducing over the following 3-year programme to the current level.

5.10.2. STRATEGIC CASE LINKAGE – LOW COST / LOW RISK

WORK CLASS (W/C)	PROBLEM /OPPORTUNITY	BENEFITS OF PROPOSED ACTIVITY	LINKAGE TO STRATEGIC COMMUNITY & GPS PRIORITY	CONSEQUENCES
341 Low Cost/low Risk	Safety: The number of fatal and serious injury crashes on our roads are high and are trending upward Accessibility: lack of safe walking and cycling alternatives Upgrading bridges HPMV Resilience of network	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.	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

5.10.3. CURRENT CONDITION AND PERFORMANCE - LCLR

It is difficult to ascertain the current condition and performance as a whole of these low-cost high-risk initiatives as they are wide and incredibly varying, but positive in their completion. However, looking at the statistics around the increasing trend in fatal and serious crashes, it is clear the community would benefit from improving high risk roads and completing more safety related initiatives, such as making intersections, footpaths and cycleways safer. Table 5 Evidence and Gap Analysis provides evidential support around Masterton pervious performance against the GPS priorities.

5.10.4. LOW COST LOW RISK STRATEGY

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 20: LCLR Assessment Criteria) 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 20: 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 (TRAFFIC VOLUME & FUNCTION)	Classification defined by NZTA ONRC 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.

Table 21: Projects LCLR

PROJECT DESCRIPTION	ACTIVITY LOCATION	PROBLEM /OPPORTUNITY	BENEFITS OF PROPOSED ACTIVITY	LINK TO STRATEGIC COMMUNITY & GPS PRIORITY	2021/22 ($,000)	2022/23 ($,000)	2023/24 ($,000)
Route Safety improvements Intersection improvements	Masterton Castlepoint Rd Various rural sealed & unsealed roads and improvements associated with rehab works Te Ore Ore Rd, Lincoln/Villa	Safety Accessibility Safety - reduce DSIs at intersections	This would include improved delineation, new guardrail installations, upgrade of hazardous guardrail end terminals, replacement of inadequate bridge rails and seal widening on High-Risk Rural Roads (HRRR) and widening and visibility improvements in conjunction with road rehabilitation. Assisted construction of stock underpasses. Implement a programme of upgrades on high/medium high-risk intersections. Improving pedestrian and cycle connections at intersections	A network that is safe, resilient and addresses current and future demand for access to economic and social opportunities	$1,905	$399	$598
Speed management: urban traffic calming	District approach to tackling unsafe speeds	Safety Accessibility	Implement speed management plan, as per the speed risk mapping. This will involve extensive community consultation and implementation in conjunction with Waka Kotahi and regional changes. Will also require physical works to reinforce the speed limit.	A network that is safe, resilient and addresses current and future demand for access to economic and social opportunities	$10	$52	$52
Walking & Cycling		Extensions and upgrades to pedestrian and	Construction of new footpaths and cycle routes. Urbanisation of near	A network that is safe, resilient and addresses current and future demand	$160	$1,470	$815

PROJECT DESCRIPTION	ACTIVITY LOCATION	PROBLEM /OPPORTUNITY	BENEFITS OF PROPOSED ACTIVITY	LINK TO STRATEGIC COMMUNITY & GPS PRIORITY	2021/22 ($,000)	2022/23 ($,000)	2023/24 ($,000)
		cycling facilities to address emerging safety problems.	urban roads following intensification of residential areas.	for access to economic and social opportunities			
Delineation Upgrade	All rural roads	Upgrade delineation to meet the required standards	Upgrade EMP's, pavement marking and curve warning signage . 6-year programme	A network that is safe, resilient and addresses current and future demand for access to economic and social opportunities	$202	$207	$207
Bridge Replacement & Upgrade to HPMV capability	Various roads	Replace or upgrade bridge to allow for HPMV traffic .	Focusing on forestry & primary production transport routes to increase network availability		$121	$289	$372
Resilience and local improvements		Resilience	Protection of local road networks from adverse events. Maintaining access	A network that is safe, resilient and addresses current and future demand for access to economic and social opportunities	470	385	102
Total					$2,868	$2,802	$2,146

5.10.5. LCLR- FINANCIAL SUMMARY EXPENDITURE

Table 22 below summarises the Low Cost/Low Risk Improvements works expenditure for the period 2018/21, and the funding request for 2022/24 period.

Table 22: Preferred Programme LCLR - Financial Summary Expenditure

WORK CATEGORY		2018/21 – 2020/21 (APPROVED NZTA) AVERAGE (PA)	2018/19 – 2020/21 (ACTUAL EXPENDITURE[1] AVERAGE (PA)	FUNDING REQUEST		
				2021/22	2022/23	2023/24
341	Low Cost/Low Risk Improvements	$742,567	$1,114,281	$2,868,720	$2,802,370	$2,146,500

5.11. ROAD SAFETY PROMOTIONS

5.11.1. 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 in the Government Policy Statement on land transport (GPS) as 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.

[1] Average expenditure calculated over 2 years

5.11.2. STRATEGIC CASE LINKAGE – NETWORK AND ASSET MANAGEMENT

WORK CLASS (W/C)	PROBLEM /OPPORTUNITY	BENEFITS OF PROPOSED ACTIVITY	LINKAGE TO STRATEGIC COMMUNITY & GPS PRIORITY	CONSEQUENCES
	The number of fatal and serious injury crashes on our roads are high and are trending upward.	Fatal and serious injury crashes will decrease on our network, reducing the harm to our customers and communities.	Safety: 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.	Fatal and serious injury crashes will continue increasing and will continue to cause significant harm to our customers and communities.

5.11.3. 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 5 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.

5.11.4. 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.

5.11.5. FINANCIAL SUMMARY EXPENDITURE

Table 23 below summarises the Road safety and Promotion expenditure for the period 2018/21, and the funding request for 2022/24 period.

Table 23: Preferred Programme -Network and Asset Management - 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	$202,064	$234,078	$267,763

5.12. VALUE FOR MONEY

Overall, Masterton receives value for money for its roading activities when compared against council peers; see Table 5 Evidence and Gap Analysis.

MDC's roading services has a procurement strategy which was endorsed by NZTA, (2019) to maximise value for money opportunities.

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 NZTA) and our partnered contractors.

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.

5.13. 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

5.14. DATA QUALITY

Masterton's RAMM data quality used in the ONRC Performance Reporting Tool has been assessed as follows. This data indicates that there may be some areas for improvement, with MDC concentrating on improvements in the following areas:

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

This will be included in the Improvement Plan for action in the 2021/23 period.

Type:	None
Categories:	Network, Asset Inventory, Maintenance Activity, Condition, Demand/Use, Crash
Importance:	High, Moderate, Low
ONRC Customer Outcomes:	Amenity, Cost Efficiency, Safety
Dimensions:	Accuracy, Completeness, Timeliness
Result:	Major, Minor, Expected, Not Applicable, No Result

2019/20 Provisional Results are now available

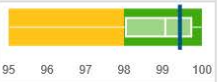
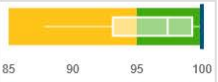
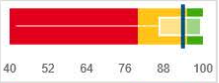
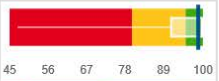
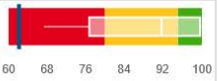
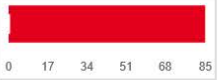
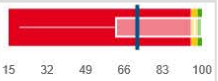
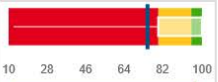
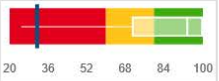
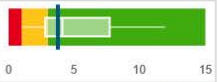
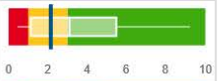
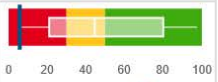
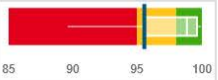
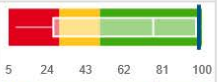
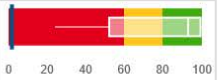
The 2019/20 results will be finalised and the annual reports will be produced when data sourced from the Waka Kotahi Transport Investment Online is finalised for the three metrics PAVE1, SURF1a and SURF1b.

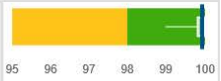
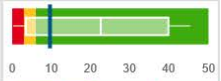
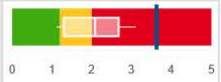
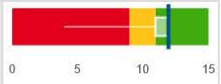
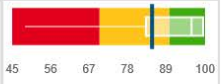
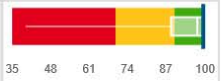
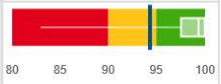
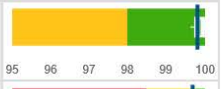
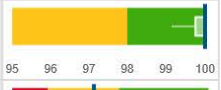
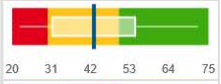
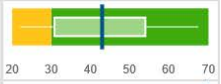
Changes to the 2019/20 calculations include the exclusion of road sections which are not required for ONRC and identifying RCA ownership of minor assets. Refer to the RAMM sql for more information about the metric changes.

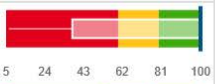
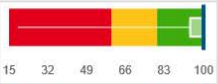
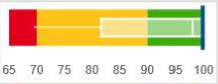
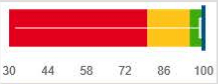
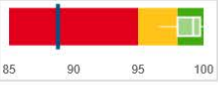
The metric reference codes have been changed due to the merging of the ONRC and asset management reports. The mapping of old and new references are available in the Metric Reference Code Set Update Help page.

● Major Issues ● Minor Issues ● Expected Standard

Category	Ref	Metric Description	Dimension	Importance	ONRC Customer Outcome	ONRC Metric	Result	Trend	
Network: **Carriageway**	CWAY1	Road network data complete	**Accuracy**	High	AMENITY COST EFFICIENCY SAFETY		98.7	—	90 92 94 96 98 100
Network: **Carriageway**	CWAY2a	Rural number of lanes matches carriageway width	**Accuracy**	Low	AMENITY COST EFFICIENCY SAFETY		99.9	—	95 96 97 98 99 100
Network: **Carriageway**	CWAY2b	Urban number of lanes matches carriageway width	**Accuracy**	Low	AMENITY COST EFFICIENCY SAFETY		99.8	—	90 92 94 96 98 100
Network: **Carriageway**	CWAY3	ONRC categories assigned to new carriageways	**Completeness**	High	AMENITY COST EFFICIENCY SAFETY		100.0	—	40 52 64 76 88 100
Network: **Carriageway**	CWAY4	ONRC categories are assigned	**Completeness**	High	AMENITY COST EFFICIENCY SAFETY		100.0	—	95 96 97 98 99 100
Network: **Carriageway**	CWAY5	Assigned ONRC category aligns with traffic data	**Accuracy**	Moderate	AMENITY COST EFFICIENCY SAFETY		70.0	▼	60 68 76 84 92 100
Network: **Carriageway**	CWAY6a	Rural carriageways are generally not short	**Accuracy**	Moderate	AMENITY COST EFFICIENCY SAFETY		89.7	—	85 90 95 100
Network: **Carriageway**	CWAY6b	Urban carriageways are generally not short	**Accuracy**	Moderate	AMENITY COST EFFICIENCY SAFETY		98.8	—	95 96 97 98 99 100
Network: **Carriageway**	CWAY7	Sealed/unsealed network correctly defined	**Accuracy**	High	AMENITY COST EFFICIENCY SAFETY		97.3	—	95 96 97 98 99 100
Network: **Treatment Length**	TREAT1	Treatment Length dimensions match sealed area	**Accuracy**	High	AMENITY		95.6	—	90 92 94 96 98 100
Network: **Treatment Length**	TREAT2a	Treatment Lengths are generally not short	**Accuracy**	High	AMENITY		90.0	—	80 85 90 95 100
Network: **Treatment Length**	TREAT2b	Treatment Lengths are not too long	**Accuracy**	High	AMENITY		76.4	▼	75 80 85 90 95 100
Network: **Treatment Length**	TREAT3	Treatment Lengths match major surfaces	**Accuracy**	Moderate	AMENITY		84.0	—	80 85 90 95 100
Network: **Treatment Length**	TREAT5	Treatment Lengths match renewals	**Timeliness**	High	AMENITY		96.7	▲	75 80 85 90 95 100
Asset Inventory: **Surfacing**	SURF1a	Achieved chipseal resurfacing renewal programme as-built	**Timeliness**	High	COST EFFICIENCY		NA	new	0 21 42 63 84 105

Category	Ref	Metric Description	Dimension	Importance	ONRC Customer Outcome	ONRC Metric	Result	Trend	
Asset Inventory: **Surfacing**	SURF1b	Achieved asphaltic concrete resurfacing renewal programme as-builted	**Timeliness**	High	COST EFFICIENCY		NA	new	
Asset Inventory: **Surfacing**	SURF2	Surface records have valid attribute data	**Accuracy**	High	COST EFFICIENCY		99.4	—	
Asset Inventory: **Surfacing**	SURF3	Surface records correctly located	**Accuracy**	High	COST EFFICIENCY		100.0	—	
Asset Inventory: **Surfacing**	SURF4	Surface records with Original Cost	**Completeness**	High	COST EFFICIENCY		93.8	▼	
Asset Inventory: **Surfacing**	SURF5	Surface records with Work Origin	**Completeness**	High	COST EFFICIENCY		98.7	▲	
Asset Inventory: **Surfacing**	SURF6	Surface records newer than pavement	**Accuracy**	Moderate	COST EFFICIENCY		62.2	—	
Asset Inventory: **Pavement**	PAVE1	Achieved pavement renewal programme as-builted	**Timeliness**	High			NA	new	
Asset Inventory: **Pavement**	PAVE2	Pavement layer records have valid attribute data	**Accuracy**	High			71.9	▼	
Asset Inventory: **Pavement**	PAVE3	Pavement layer records with Work Origin	**Completeness**	High			75.0	▼	
Asset Inventory: **Footpath**	FOOT1	Footpath asset known	**Completeness**	Moderate			99.7	—	
Asset Inventory: **Footpath**	FOOT2	Footpath asset records maintained	**Timeliness**	Low			4.9	▲	
Asset Inventory: **Drainage**	DRAIN1	Culvert assets known	**Completeness**	Moderate			31.5	▼	
Asset Inventory: **Drainage**	DRAIN2	Culvert asset records maintained	**Timeliness**	Low			3.8	▼	
Asset Inventory: **SW Channel**	SWC1	SWC asset known	**Completeness**	Moderate			6.9	—	
Asset Inventory: **SW Channel**	SWC2	SWC asset records maintained	**Timeliness**	Low			2.2	▼	
Asset Inventory: **Signs**	SIGNS1	Sign assets known	**Completeness**	Moderate			5.8	▲	
Asset Inventory: **Signs**	SIGNS2	Sign asset associated to a 'road'	**Accuracy**	Low			95.6	—	
Asset Inventory: **Signs**	SIGNS3	Sign replacement activity	**Timeliness**	Low			32.1	—	
Asset Inventory: **Railings**	RAIL1	Railing assets known	**Completeness**	Moderate			98.5	—	
Asset Inventory: **Railings**	RAIL2	Railing asset records maintained	**Timeliness**	Low			68.1	▼	
Asset Inventory: **Retaining Walls**	RETAIN1	Retaining Wall assets known	**Completeness**	Moderate			1.7	▼	

Category	Ref	Metric Description	Dimension	Importance	ONRC Customer Outcome	ONRC Metric	Result	Trend	
Asset Inventory: **Retaining Walls**	RETAIN2	Retaining wall asset records maintained	**Timeliness**	Low			8.6	new	
Asset Inventory: **Streetlights**	LIGHTS1	Streetlights associated with a 'road'	**Accuracy**	Low			83.9	—	
Asset Inventory: **Streetlights**	LIGHTS2	Streetlights records have a light	**Completeness**	Low			99.9	—	
Asset Inventory: **Streetlights**	LIGHTS3	Streetlight replacement activity	**Timeliness**	Low			9.7	▲	
Maintenance Activity: **Maintenance Activity**	MAINT1	Consistency of pavement, surfacing and shoulder maintenance activity units	**Accuracy**	Moderate	COST EFFICIENCY		3.6	▼	
Maintenance Activity: **Maintenance Activity**	MAINT2	Complete pavement and surface maintenance activity	**Completeness**	High	COST EFFICIENCY		12.0	▲	
Maintenance Activity: **Maintenance Activity**	MAINT3	Pavement, surfacing, shoulder and drainage maintenance activity known	**Completeness**	Moderate	COST EFFICIENCY		84.7	▼	
Maintenance Activity: **Maintenance Activity**	MAINT4	Correctly located pavement and surface maintenance activity	**Accuracy**	High	COST EFFICIENCY		85.1	▼	
Maintenance Activity: **Maintenance Activity**	MAINT5	Correctly located shoulder and drainage maintenance activity	**Accuracy**	Low	COST EFFICIENCY		99.4	▲	
Maintenance Activity: **Maintenance Activity**	MAINT6	Level of pavement, surfacing, shoulder and drainage maintenance activity known	**Completeness**	High	COST EFFICIENCY		94.4	—	
Maintenance Activity: **Maintenance Activity**	MAINT7	Pavement and surface maintenance activity has a valid location	**Accuracy**	High	COST EFFICIENCY		99.5	—	
Condition: **Roughness**	ROUGH1	Roughness survey within 2.5 years	**Completeness**	High	AMENITY		99.9	—	
Condition: **Roughness**	ROUGH2	Roughness data has valid location	**Accuracy**	High	AMENITY		99.8	—	
Condition: **Rating**	RATING1	Road rating data current	**Completeness**	High			93.5	—	
Condition: **Rating**	RATING2	Rating data locations valid	**Accuracy**	Moderate			100.0	—	
Demand/Use: **Traffic Count**	COUNT1	Well targeted traffic count programme	**Completeness**	High	AMENITY COST EFFICIENCY		43.0	▲	
Demand/Use: **Traffic Count**	COUNT2	Traffic count programme activity on sealed network	**Timeliness**	Moderate	AMENITY COST EFFICIENCY		17.6	▼	
Demand/Use: **Traffic Count**	COUNT3	Traffic loading understood	**Completeness**	High	AMENITY COST EFFICIENCY		43.0	▲	
Demand/Use: **Traffic Estimates**	ESTIM1	Network has traffic estimates	**Completeness**	High	AMENITY COST EFFICIENCY		100.0	—	

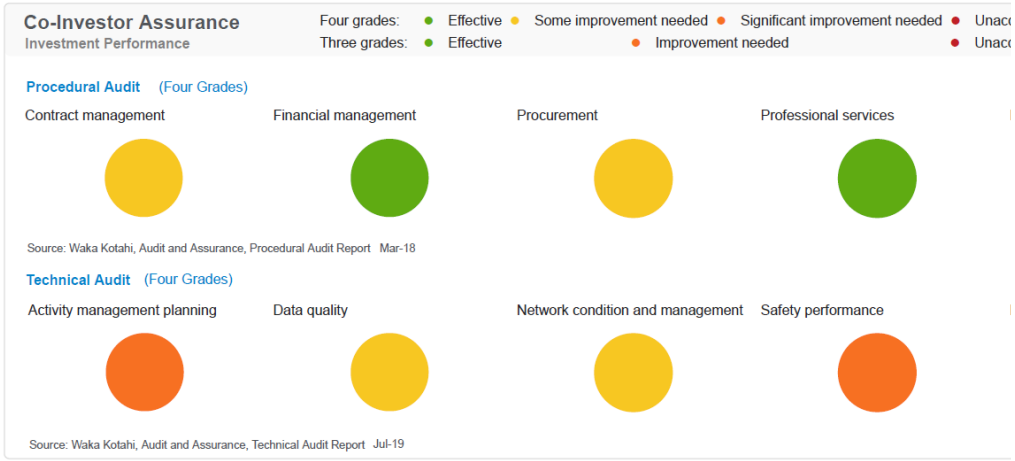
Category	Ref	Metric Description	Dimension	Importance	ONRC Customer Outcome	ONRC Metric	Result	Trend	
Demand/Use: **Traffic Estimates**	ESTIM2a	Traffic estimates are maintained (High Volume to Arterial)	**Timeliness**	High	AMENITY COST EFFICIENCY		100.0	—	
Demand/Use: **Traffic Estimates**	ESTIM2b	Traffic estimates are maintained (Primary and Secondary Collectors)	**Timeliness**	High	AMENITY COST EFFICIENCY		100.0	—	
Demand/Use: **Traffic Estimates**	ESTIM2c	Traffic estimates are maintained (Access including Low Volume)	**Timeliness**	High	AMENITY COST EFFICIENCY		100.0	—	
Demand/Use: **Traffic Estimates**	ESTIM3	Traffic estimates updated following counts	**Accuracy**	High	AMENITY COST EFFICIENCY		99.9	▲	
Demand/Use: **Traffic Estimates**	ESTIM4	Considered traffic loading	**Completeness**	High	AMENITY COST EFFICIENCY		100.0	—	
Crash: **Crash Data**	CRASH1	Crash data is recent	**Timeliness**	Moderate	SAFETY		0.0	new	
Crash: **Crash Data**	CRASH2	Crash records with valid location	**Accuracy**	Moderate	SAFETY		88.8	—	

Date imported: **31st July 2020**

Notes:

NZTA AUDITS

The Masterton District Council has been subject to several NZTA audits and assessments over the past two years. 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:



5.14.1. 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 AM P'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).

5.15. PREFERRED PROGRAMME OF WORKS MAINTENANCE, OPERATIONS AND RENEWALS

For 2021/23 programme of works, Masterton is seeking a funding increase to their Maintenance, Operations and Renewals (MOR) programme. For many years Masterton has been underspending when compared to its peers. This increase covers current contract rates for resurfacing and pavement renewals, in order to improve the declining condition and upward average age of the network Current contract cost increases and escalation accounts for a total of about $2.098M or 14% to the total budget over the 3-year period (2018/19 to 2020/21). We are also looking to reinvest money where we can achieve the greatest impact on the customer LOS.

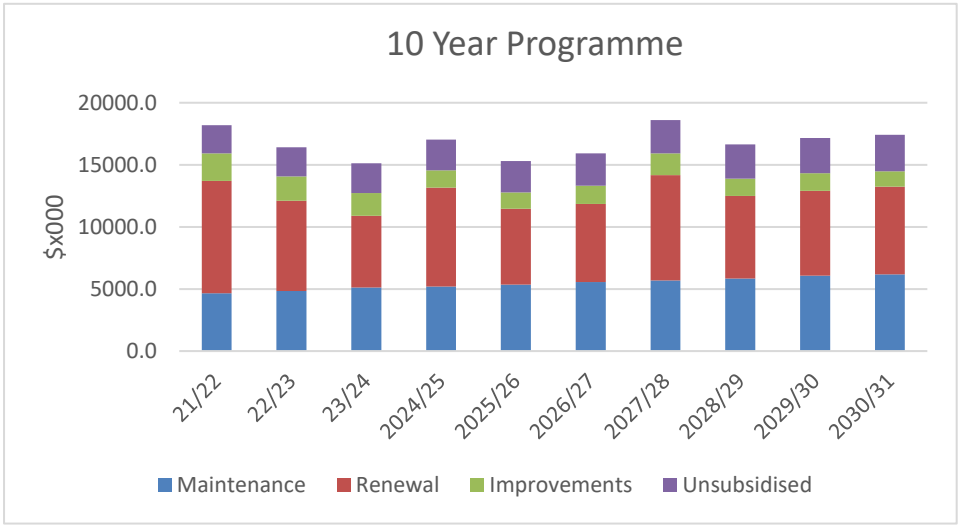


Table 24: Maintenance Operations and Renewals

		Proposed 2021/24 Programme Yr 1 21/22	Yr 2 22/23	Yr 3 23/24
	MAINTENACE & OPERATIONS			
111	**Sealed Pavement Maintenance**	693.0	715.9	738.1
	Pre-seal repairs (30%)	297.0	306.8	316.3
112	**Unsealed Pavement Maintenance**	610.9	631.1	650.7
113	**Routine Drainage Maintenance**	517.4	534.5	551.1
	Street Cleaning (30% subsidisable)	50.4	52.1	53.7
114	**Structures Maintenance**	133.8	138.2	142.5
121	**Environmental Maintenance - other (25%)**	164.7	170.1	175.4
	Winter mtce (25%)	164.7	170.1	175.4
	Vegetation (50%)	329.4	340.3	350.8
122	**Traffic Services Maintenance**	97.4	131.9	200.4
	Power supply	66.5	68.7	70.9
124	**Cycle Path Maintenance**	10.1	10.4	10.7
125	**Footpath Maintenance**	65.5	67.7	69.8
131	**Level Crossing Maintenance**	21.9	22.6	23.3
140	**Minor Events**	191.5	197.8	204.0
151	**Network & Asset Management**	1119.8	1156.7	1192.6
	Mgmt Asset data	126.0	130.2	187.9
		4660.1	4845.1	5113.4
	RENEWALS			
211	**Unsealed Road Metalling**	1035.0	1069.2	1102.3
212	**Sealed Road Surfacing**	1240.9	1212.1	1343.1
	TAC	75.6	147.9	59.0
213	**Drainage Renewals**	867.6	356.9	367.9
	Kerb & channel	161.3	166.6	171.8
214	**Pavement Rehabilitation - granular**	1158.6	1196.8	858.2
	Structural AC rehab	222.8	0.0	375.7
215	**Structures Component Replacement**	143.6	148.3	152.9
216	**Bridge Renewals**	1499.9	1707.7	0.0
	Retaining Wall Renewal	199.6	0.0	16.1
222	**Traffic Services Renewals**	856.6	689.2	753.5
225	**Footpath Renewal**	1590.6	555.0	572.2
		9052.2	7249.6	5772.8
	Local Road Maintenance	**13712.3**	**12094.7**	**10886.2**

6. RISK

6.1. 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

Following are the processes involved in the risk management:

6.2. BACKGROUND

6.2.1. 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 & 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)

6.2.2. 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.

6.2.2.1. 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

6.3. RISK REVIEW PROCESS

6.3.1. 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.

6.3.2. RISK REGISTER UPDATE

Improvements

The updated risk registers have been further developed to include likelihood and consequence scorning 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.

6.3.3. RISK METHODOLOGY & SCORES

6.3.3.1. Risk Stages

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

6.3.3.2. 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

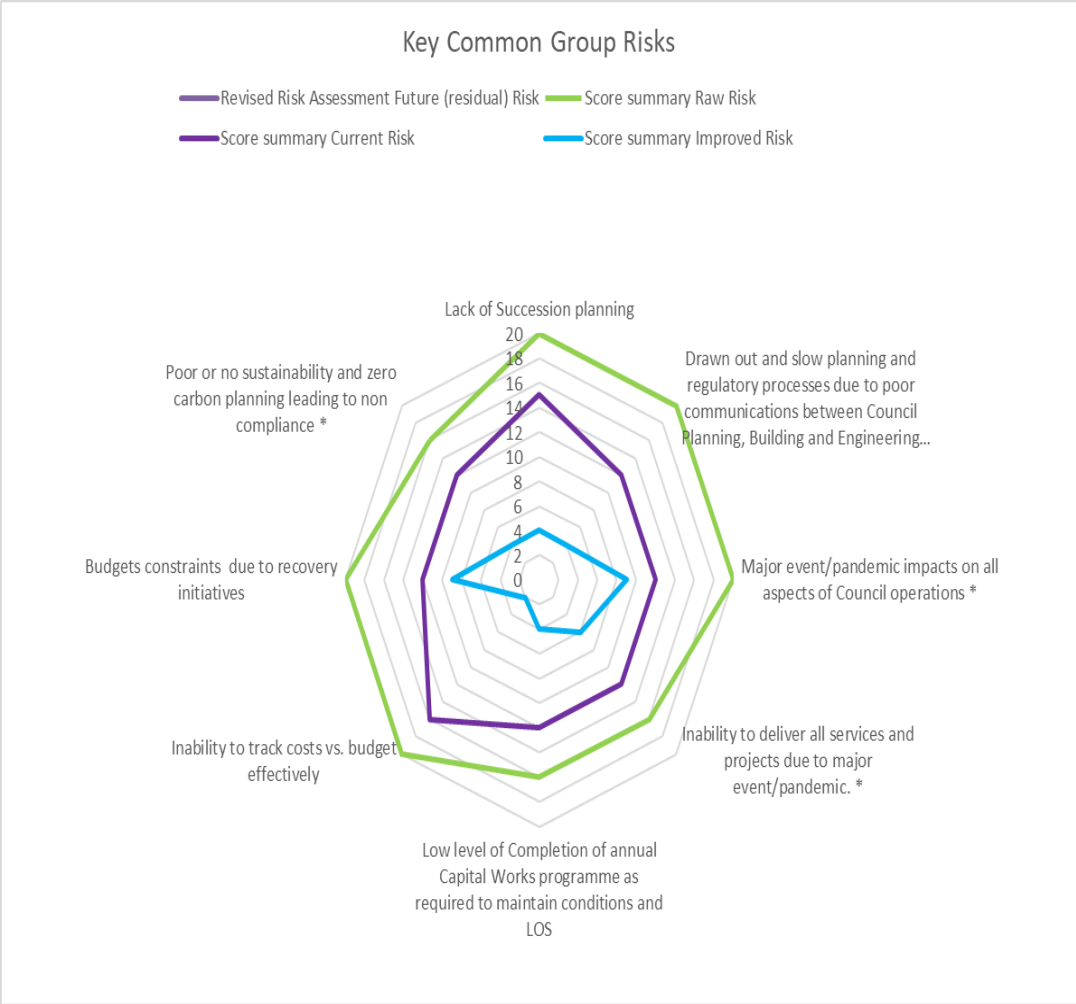
Step 2:

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

6.4. 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.

6.4.1. 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.

6.4.1.1. 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:

6.4.1.2. 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			
	Raw Risk	Current Risk	Improved Risk	Improvement Items
Lack of Business Continuity Planning	15	9	6	[P] Review & revise BCPs [P] Trial /training run events to test BCPs [P] WSP IP implementation

GROUP IMPROVEMENT ITEMS

Risk Description	Score summary			
	Raw Risk	Current Risk	Improved Risk	Improvement Items
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	16	4	2	[P] Review staff resourcing requirements and link in with succession planning and recruitment

GROUP IMPROVEMENT ITEMS

Risk Description	Score summary			
	Raw Risk	Current Risk	Improved Risk	Improvement Items
Treatment Plant operators)				
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
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

GROUP IMPROVEMENT ITEMS

Risk Description	Score summary			
	Raw Risk	Current Risk	Improved Risk	Improvement Items
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	16	12	6	[P] monitoring impacts and revision responses and budgets

GROUP IMPROVEMENT ITEMS				
Risk Description	Score summary			
	Raw Risk	Current Risk	Improved Risk	Improvement Items
Pandemic impacts				
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 & procurement planning review and improvement
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.

6.5. ROADING KEY RISK SUMMARY

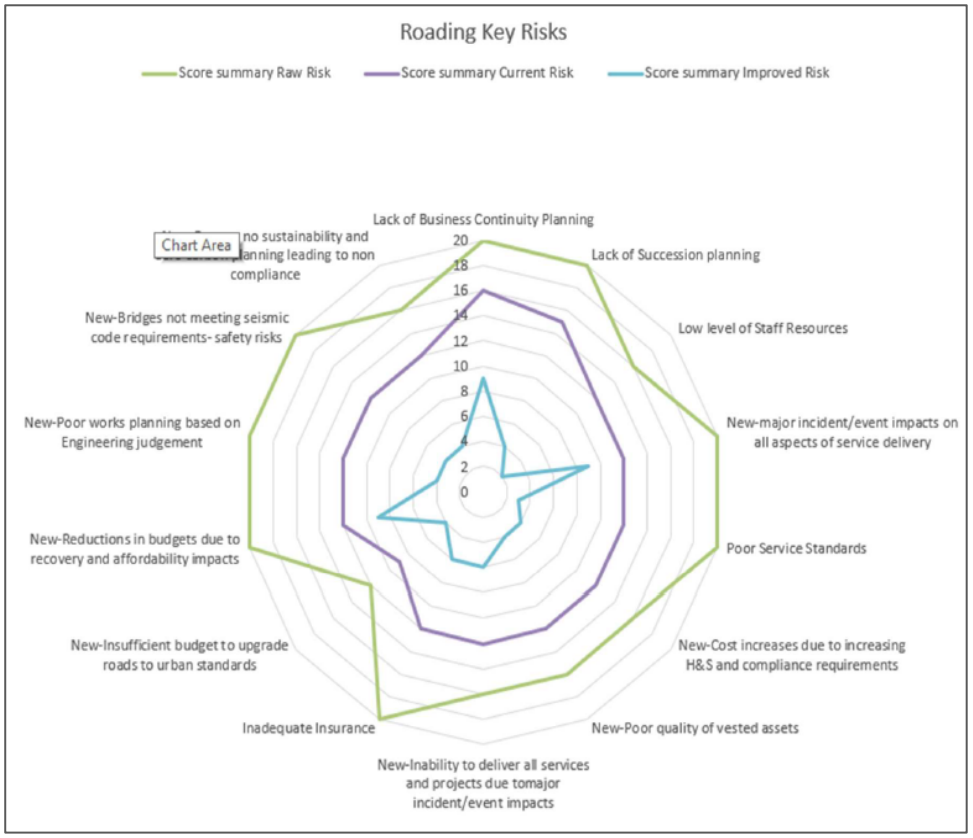
A Risk Register and treatment Plan has been developed in alignment with Masterton District Council corporate Risk Policy and current industry best practise. Risk are monitored and reported in accordance with MDC Risk Policy.

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.

6.5.1. 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:



6.5.2. 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 H&S and compliance requirements	16	6	4	[P] Update long term budget forecasts in LTP and NZTA submissions

Roading Risk improvement actions				
Risk Description	Score summary			Improvement Items
	Raw Risk	Current Risk	Improved Risk	
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	20	12	4	[P] Prioritise inspections and

Roading Risk improvement actions				
Risk Description	Score summary			Improvement Items
	Raw Risk	Current Risk	Improved Risk	
requirements-safety risks				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 Roading risks, please refer the MDC Roading risk register and Assets and Operation Risk review 2020 document.

6.6. 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	$20,000	2021	LTP roading budget and corporate fund

plans, training, and mock trials			
[P] develop robust succession plans for key positions. Develop staff recruitment/retention strategies	Within Roading budgets	2021	LTP roading budget and corporate fund
[P] staff resource planning and recruiting [P] Succession planning	Within Roading budgets	2021	LTP roading budget and corporate fund
[P] Update long term budget forecasts in LTP and NZTA submissions	Within Roading budgets	Started 2019 for 2021	LTP roading budge
[P] Review ECOP to 4404 Stds [P] Review works approval, monitoring and sign off procedures	Within Roading budgets	From 2021	Corporate and road budget
{P} Council review risk appetite and insurance options	$20,000 plus council time	2020 workshops for 2021	Roading and asset budget
[P] Review road upgrade programme and budgeting as part of LTP process	Within Roading budgets	From 2020 to 2021	LTP roading budget
[P] Review and prioritise DTIMS planning and decision-making	Within Roading budgets	From 2019 for 2021	LTP roading budget
[P] Prioritise inspections and related works fed into LTP and AP budgets	Within Roading budgets	From 2020 for 2021	LTP roading budget
[P] Develop activity plans and actions based on Council objectives and policy	Within Roading budgets	From 2021	LTP roading budget

7. LIFECYCLE MANAGEMENT

7.1. 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 & Guardrails
- Footpaths & Pedestrian Crossings
- Vegetation & Streetscape
- Parking Facilities

7.2. 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

7.3. 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 life cycle.

7.3. 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.

7.3.1. 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:

7.3.2. ASSET DESCRIPTION (INC.HOW ASSET DATA IS STORED)

Masterton District Council responsible for the maintenance of about 517 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 18: Sealed Pavements - Category Groups

SEALED PAVEMENTS - CATEGORY GROUPS			
Road Type	Category	ONRC Category	Length (Km)
Sealed (S1)	Urban	Low volume	32.5
		Access	22.7
		Secondary collector	41.4
		Primary collector	15
		Arterial	6.4
	Rural	Low volume	23.6
		Access	173.4

SEALED PAVEMENTS - CATEGORY GROUPS			
Road Type	Category	ONRC Category	Length (Km)
		Secondary collector	199.5
		Primary collector	17.3
	Total		**532 Km**

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

Table 19: Sealed Pavements – Lane Lengths

SEALED PAVEMENTS - LANE LENGTHS				
Group	Single Lane (km)	Double Lane (km)	Triple Lane (km)	Total (km)
Sealed roads (S1)	70	461	0.4	532

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.

7.3.3. ASSET CONDITION AND MONITORING

7.3.3.1. Pavement Age

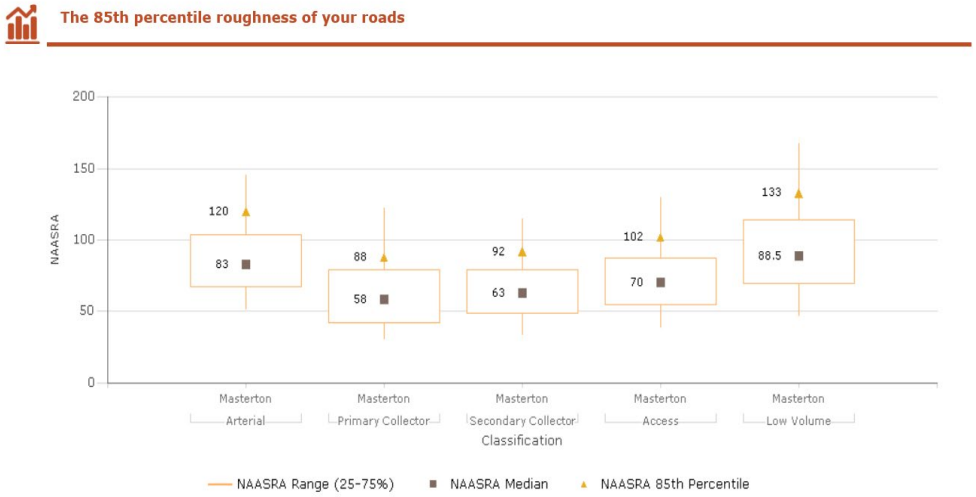
Historically there had been no records kept of the sealed pavement structural layer. However, it is estimated that the age of original pavements varies from 0 years to >80 years. Every year, sealed pavements are upgraded generally by incremental granular overlay or through various stabilisation methods.

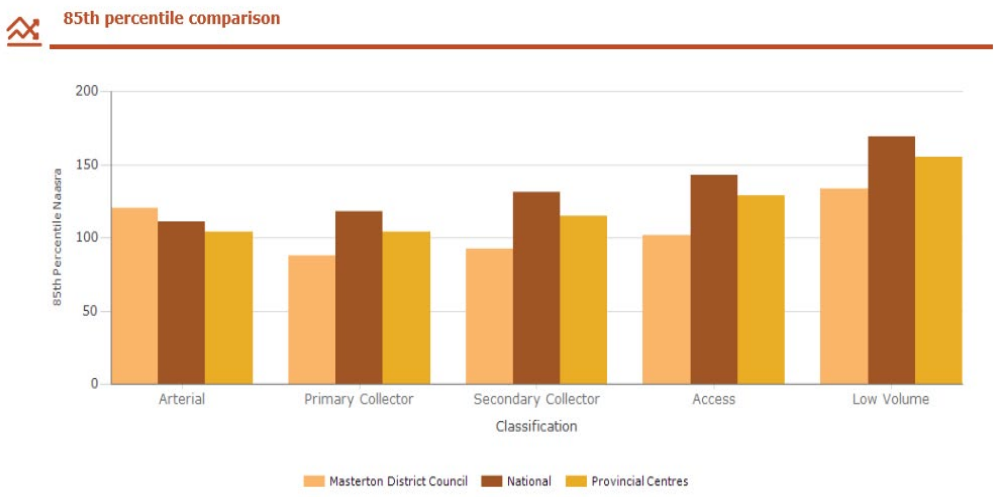
In general, sealed road pavements in New Zealand are designed for a 25-year life. But from experience, it has been observed that a road pavement can last up to 80 years with proper maintenance. The main factor in determining the life and performance of a flexible pavement is the expected traffic loading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

7.3.3.2. Road Roughness

Figure 27: 85%tile Roughness ***Comparison***





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 28: 19/20 NAASRA Counts

NAASRA COUNTS			
2019/20 – NAASRA count	85th Percentile	Medium	Average
Arterial	73.4	98.7	78.7
Primary Collector	70.6	98.6	76.7
Secondary Collector	69.5	97.2	75.9
Access	68.9	100.8	76.5
Low Volume	68.9	101.7	76.5

7.3.3.3. Pavement Condition Rating

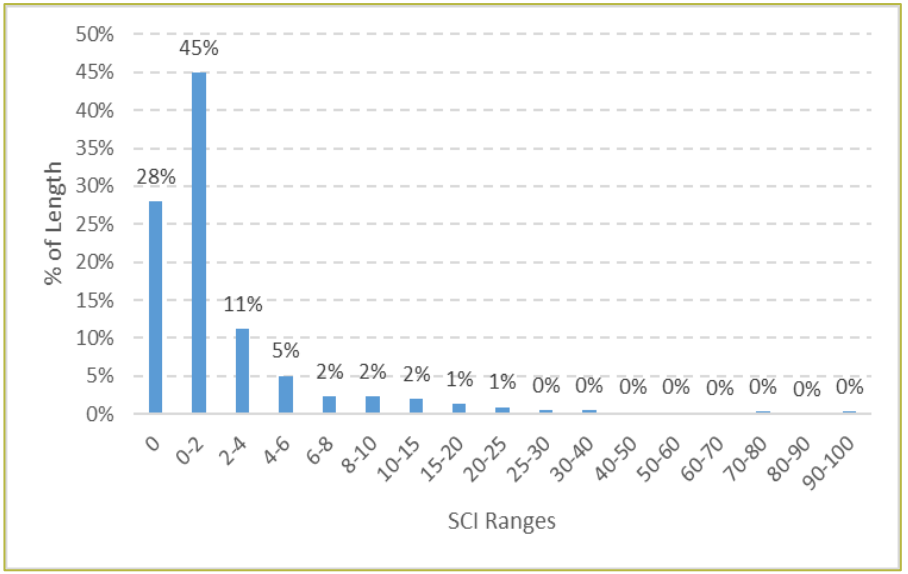
The condition of sealed pavement having ADT>500 is monitored on an annual basis with a complete network survey completed every two years. The most recent survey was completed in 2020.

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 29:Distribution of SCI Values



7.3.3.4. Pavement & Condition Integrity Index (PII &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 30: PII Distribution

Figure 30: PII Distribution

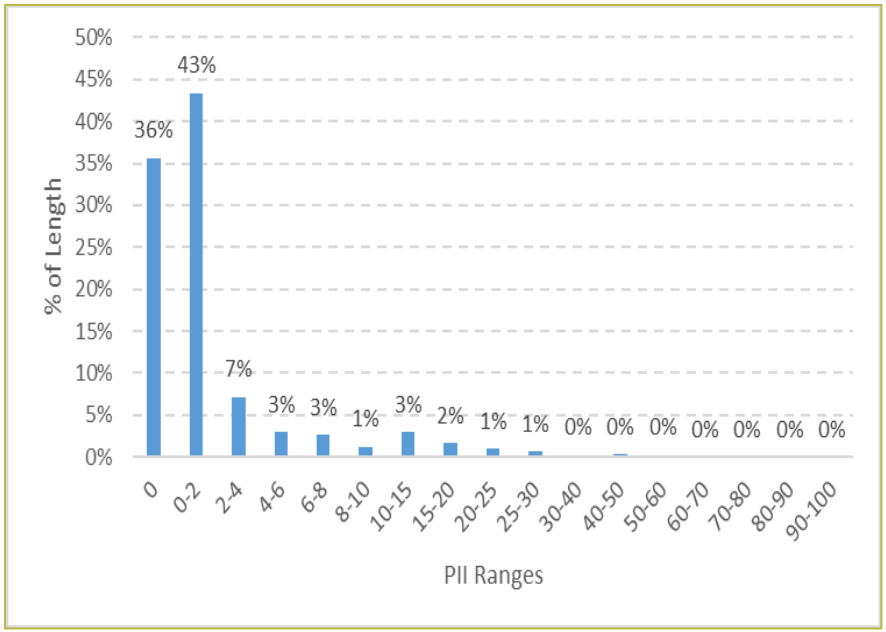
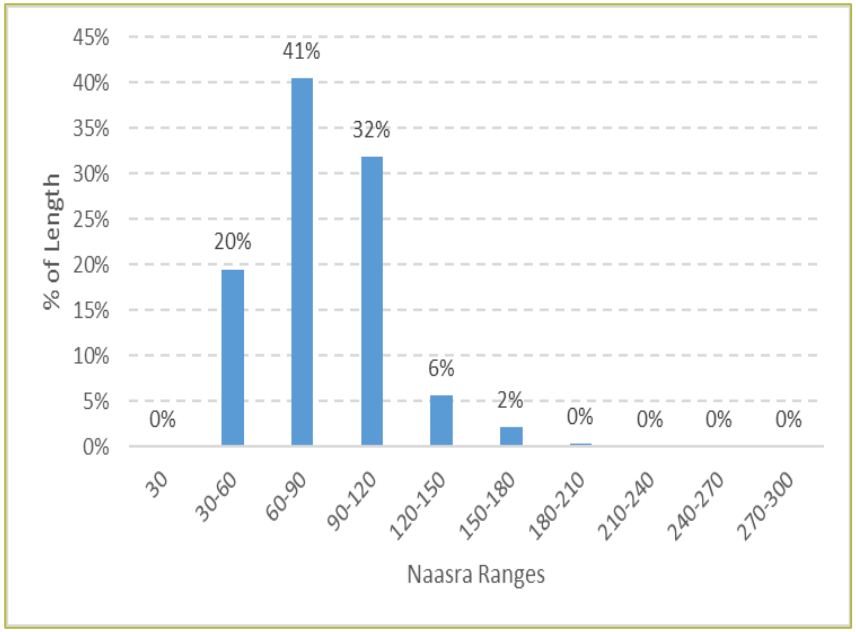


Figure 31: Distribution of Naasra Values



7.3.3.5. 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.

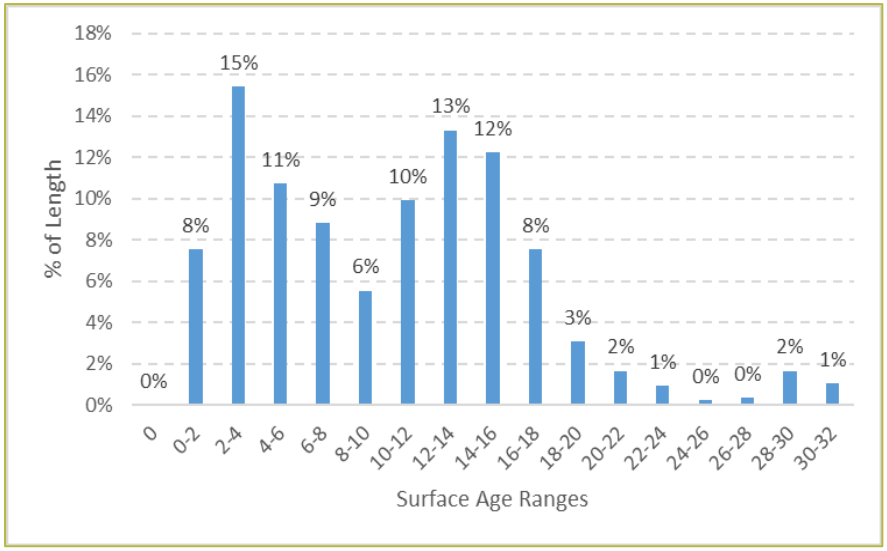
7.3.3.6. Skid Resistance

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

7.3.3.7. Age Distribution and Life

The age of most Council sealed pavement surfaces is less than 16 years. Over the lifecycle of the networks' pavement length there is an estimated average annual amount of the 6km of pavement rehabilitation. About 33 km of pavements are resealed. The age distribution of sealed road surfaces is shown in Figure 33.

Figure 32: Distribution of Surface Age



15% of the network length have surface ages of between 2 and 4 years. 25% of the network length have surface ages between 12 and 16 years, while 16% of the network length have surface ages greater than 16 years. There were no values available for 2% of the network length.

7.3.3.8. Position

Council is currently rehabilitating 6-8 km of sealed pavement annually. Forestry logging on rural roads in Masterton District is increasing. The recommendations were.

- The quantity and location of harvesting can be locally predicted by consultation with Forestry holdings owners
- The likely quantity of rehabilitation required can be readily catered for in the existing programme.
- 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.
- The current prediction of harvest volumes of harvesting will increase from current levels over the next 10 years.
- The forecast harvesting needs be continually reviewed to confirm current predictions and the 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 AWPT sites likely to justify treatment over the next three years.

7.3.3.9. Significant Negative Effects of Sealed Roads

The significant negative effects of the sealed roading network in the Masterton district are outlined in Table 26.

Table 25: 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

7.3.3.10. 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.

7.3.4. DESIGN AND SERVICE STANDARDS

7.3.4.1. 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 26: Rural Road Widths

RURAL ROAD WIDTHS			
Category	Target	Complying	Not complying
Primary & Secondary Collector	7m	62km	153km
Access & Low Volume	6m	64km	78km
Access & Low Volume	4m	33km	31km
Access	5m	16km	8km
Low Volume	5m	7km	3km
Access	4m	46km	20km

RURAL ROAD WIDTHS			
Category	Target	Complying	Not complying
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 NZTA 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.

7.3.5. SAFETY

The NZTA collects crash data on behalf of the 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 sealed roads has been carried out on the last five complete years and is presented in Figure 33. Data is sourced from NZTA Crash Analysis System (CAS) and is loaded into the RAMM.

Figure 33 Five years Crash data Sealed Roads SH2 excluded

Overall crash statistics

Crash severity

Crash severity	Number	%	Social cost $(m)
Fatal	9	1.39	39.20
Serious	47	7.24	27.81
Minor-injury	168	25.89	14.76
Non-injury	425	65.49	10.67
TOTAL	649	100	92.44

Crash numbers

Year	Fatal	Serious	Minor	Non-injury
2016	2	3	23	83
2017	2	14	31	88
2018	3	11	31	72
2019	1	9	34	81
2020	1	4	23	40
TOTAL	9	41	142	364
Percent	1.62	7.38	25.56	65.47

Note: Last 5 years of crashes shown.

Overall casualty statistics

Injury severity

Injury severity	Number	% all casualties
Fatal	10	3.58
Serious Injured	56	20.07
Minor Injured	213	76.34
TOTAL	279	100.00

Casualty numbers

Year	Fatal	Serious Injured	Minor Injured
2015	0	6	32
2016	3	5	27
2017	2	17	39
2018	3	14	45
2019	1	10	38
2020	1	4	32
TOTAL	10	56	213
Percent	3.58	20.07	76.34

Note: Last 5 years of crashes shown (unless query includes specific date range).

The CAS calculated social cost for five years of crashes on MDC sealed roads is 92.44 million dollars.

7.3.6. 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.

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, & 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, & 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 27 outlines the response times for maintenance works as per the contract document.

Table 27: 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

7.3.7. FINANCIAL

The Roading asset components were valued as follows, as at 30th June 2020. Data was sourced from the MDC Annual Report 2020 and includes all (sealed & unsealed) land and formation.

Table 28: Asset Valuation – All Roads (2020)

ASSET VALUATION – ALL ROADS (2020)			
Item	Optimised Replacement Cost ($)	Optimised Depreciated Replacement Cost ($)	Annual Depreciation ($)
Land	87,106,136	87,106,156	0
Formation	290,945,911	290,945,891	0
Pavement	103,231,684	74,046,020	1,938,766
Shoulders	8,804,906	5,848,935	116,257
Sealed Surfacing	28,040,017	14,443,980	981,977

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 annual reports.

7.3.8. HISTORICAL EXPENDITURE

Historical expenditure on sealed road assets from previous years is summarised in Table 29 Data is sourced from financial reports.

Table 29: Historical Expenditure – Sealed Roads

HISTORICAL EXPENDITURE – SEALED ROADS				
Year	Pavement Maint. ($)	Re-seal ($)	Rehabilitation ($)**	Total Spend ($)
2017-18	839563	1086051	520373	2445987
2018-19	114393	972564	689848	2806405
2019-20	802396	990700	967314	2760410
2020/21 (forecast)	895800	1085000	736200	2717000

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.

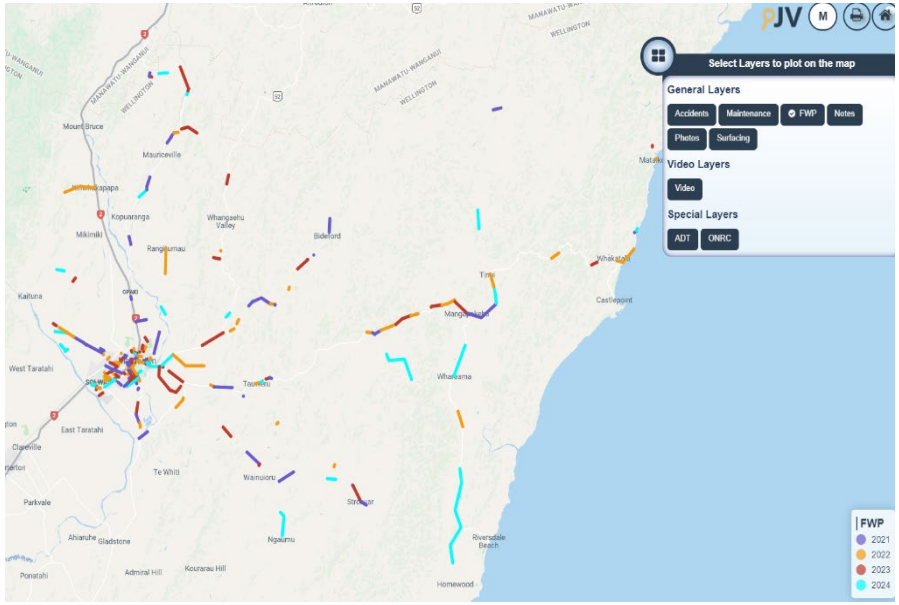
Table 30: Ten-year forecast

TEN-YEAR FORECAST				
Year	Approximate Expenditure ($ '000)			
	Renewal	Maintenance	Total	BERL inflation forecast %
2021 – 22	2697.9	990.0	3687.9	0.8
2022 – 23	2556.8	1022.7	3579.5	3.3
2023 – 24	2636.0	1054.4	3690.4	3.1
2024 – 25	2712.5	1084.9	3797.4	3.0
2025 – 26	2791.1	1116.4	3907.5	2.9
2026 - 27	2872.1	1148.8	4020.9	2.9
2027 - 28	2955.4	1182.1	4137.5	2.9
2028 – 29	3041.1	1216.4	4257.5	2.9
2029 - 30	3129.3	1251.6	4380.9	2.9
2030- 31	3220.1	1287.9	4508.0	2.9

7.3.9. 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 section 5 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 being refined)
- 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 NZTA financial assistance can be obtained.

7.3.10. 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. NZTA 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 NZTA 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.

7.3.11. 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 6-8 km of sealed pavement annually. 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 were 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 2021 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 treatment over the next three years.

*Note – the work sites listed are provisional only and will be confirmed by the Project Manager prior to each year's activity. *Table 31: Pavement Rehabilitation Programme*

SEALED PAVEMENT REHABILITATION PROGRAMME															
Road_ID	Road_Name	Site_Location	RP_Start	RP_End	Surface_Date	Length	Cost	Programme_$							
								2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	Future
Sealed Roads - Rural															
270	Te Ore Ore Bideford		15900	16900	Gr 5 '04	1000	$247			247					
214	Paierau Rd	Matahiwi Estate	1400	3396	Gr3/5 '09	1996	$619							$619	
214	Paierau Rd	Millers	7052	7746	Gr3 '02	694	$215								215
208	Opaki Kaiparoro	Bowen Rd	21519	22129	Gr4 '05	610	$189						$189		
208	Opaki Kaiparoro	No4 Brg -rail xing	13300	14000	Gr4 '05	700	$217					217			
208	Opaki Kaiparoro	Bowen Rd	22129	22509	Gr5 '00	380	$118							$118	
128	Manawa Rd		6700	6900	Gr3/5 '10	200	$62								62
128	Manawa Rd		8100	8300	Gr3/5 '10	200	$62								62
192	Ngaumu Rd	Motukai to Skeets	3745	4500	Gr4 '05	755	$234					234			
176	Morris Rd		1550	1770	Gr4 '99	220	$68						$68		
308	Watsons Rd		3365	3750	Gr 5 '00	385	$119				119				

SEALED PAVEMENT REHABILITATION PROGRAMME

Road _ID	Road_Name	Site_Location	RP_Start	RP_End	Surface _Date	Length	Cost	Programme_$							
								2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	Future
405	Whangaehu Valley Rd		6300	6773	Gr 5 '00	500	$155			155					
405	Whangaehu Valley Rd		10300	10700	Gr 5 '01	400	$124				124				
405	Whangaehu Valley Rd		11000	11300	Gr 5 '01	300	$93						$93		
405	Whangaehu Valley Rd		15800	16300	Gr 5 '04	500	$155					155			
405	Whangaehu Valley Rd		16900	17300	Gr 3/5 '07	400	$124							$124	
405	Whangaehu Valley Rd		18300	18800	Gr 3/5 '07	500	$155							$155	
405	Whangaehu Valley Rd		19000	19300	Gr 3/5 '07	300	$93							$93	
405	Whangaehu Valley Rd		17600	18300	Gr 3/5 '07	700	$217								217
146	Mstn - Stronvar	Brancepeth airstrip	16700	17000	Gr 3 '01	300	$93							$93	
146	Mstn - Stronvar		17980	18330	Gr 3 '02	350	$109							$109	
146	Mstn - Castlepoint	Blairlogie Hill	21950	23750	Gr3 '04	1800	$558						$558		
147	Mstn - Castlepoint	Beauly	27150	29560	Gr 3 '06	2410	$747								747
142	Mstn - Castlepoint	Peaks Rd	38600	39120	Gr3/5 '16	520	$161						$161		

SEALED PAVEMENT REHABILITATION PROGRAMME															
Road _ID	Road_Name	Site_Location	RP_Start	RP_End	Surface _Date	Length	Cost	Programme_$							
								2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	Future
319	Westmere Rd		4430	5390	Gr4/6 '10	960	$246	$246							
145	Te Whiti Rd	Council Sewer ponds	3710	3990	Gr4 '04	280	$87					$87			
					Costs rural sealed roads			246		402	243	693	1070	1310	1303
Sealed Roads - Urban															
95	Dixon St	Bruce St - Church St	356	678	AC '04	322	$177				177				
315	Queen St	Park St - Worksop	711	1280	AC '98	569									
404	Te Ore Ore Rd		740	960	Gr3/5 '09	220	$424	$424							
404	Te Ore Ore Rd		39	140	Gr3/5 '09	101	$273		273						
368	Worksop Rd		12	100	AC '04	88	$138			138					
324	Renall		152	370	AC '01	218	$180		180						
324	Renall St Pownall RAB		932		AC '12		$150			150					

SEALED PAVEMENT REHABILITATION PROGRAMME															
Road _ID	Road_Name	Site_Location	RP_Start	RP_End	Surface _Date	Length	Cost	Programme_$							
								2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	Future
194	Ngaumutawa Rd	Renall RAB	1650		AC '03		$250				250				
					Costs Sealed Urban Rd			424	453	288	427				

NBs: 1, Subject to harvest 2, Foundation work

7.3.12. MAINTENANCE SURFACING

Council is currently undertaking approximately 33km 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

7.3.13. 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.

7.3.14. CRITICAL ASSETS

Table 83: 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,
Upper Plain Rd	Fault displacement, Flooding
Masterton – Stronvar Rd	Flooding
Manawa Rd	Flooding
Mataikona Rd	Flooding, Windstorm, Tsunami, Wildfire, Landslide

7.3.15. 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

7.4. UNSEALED PAVEMENTS

This section covers the unsealed paved roads that Masterton District Council owns and maintains.

7.4.1. 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 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.

7.4.2. 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 32 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

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 33 Unsealed Roads Summary, and these classes are used to determine the level of maintenance activity for these roads.

Table 33 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 =/> 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 34: Unsealed Pavements - Lane Lengths

Unsealed Roads – Lane Lengths		
Single Lane (km)	Double Lane (km)	Total (km)
242.8	35.2	278

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

7.4.3. 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, & traffic volumes

7.4.4. 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 34

Table 35: 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

7.4.5. ASSET CAPACITY / PERFORMANCE

Performance of the carriageway assets has been assessed in terms of capacity, customer satisfaction and safety.

7.4.5.1. 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.

7.4.5.2. 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.

7.4.5.3. Safety

The NZTA 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 sealed roads has been carried out on the last five complete years and is presented in Table 36. 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 sealed roads is 6 million dollars.

Table 36: Last Five years Crash data on Unsealed Roads

Fatal crashes: 1 | Injury crashes: 4 | Non-injury crashes: 8 | Total crashes: 13

Overall crash statistics

Crash severity

Crash severity	Number	%	Social cost $(m)
Fatal	1	7.69	4.96
Serious	1	7.69	0.61
Minor-injury	3	23.08	0.11
Non-injury	8	61.54	0.31
TOTAL	13	100	6.00

Crash numbers

Year	Fatal	Serious	Minor	Non-injury
2016	0	0	0	1
2017	0	1	0	2
2018	1	0	0	2
2019	0	0	0	2
2020	0	0	2	0
TOTAL	1	1	2	7
Percent	9.09	9.09	18.18	63.63

Note: Last 5 years of crashes shown.

Overall casualty statistics

Injury severity

Injury severity	Number	% all casualties
Fatal	1	14.29
Serious Injured	2	28.57
Minor Injured	4	57.14
TOTAL	7	100.00

Casualty numbers

Year	Fatal	Serious Injured	Minor Injured
2015	0	0	1
2016	0	0	0
2017	0	1	0
2018	1	1	1
2019	0	0	0
2020	0	0	2
TOTAL	1	2	4
Percent	14.29	28.57	57.14

Note: Last 5 years of crashes shown (unless query includes specific date range).

7.4.6. DESIGN AND SERVICE STANDARDS

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 37

Table 37: 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 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.

7.4.7. 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 38 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 38: 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.

7.4.8. 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 39 and are from section 7.2 of the contract

Table 39: Response Times – Unsealed Roads

RESPONSE TIMES – UNSEALED ROADS		
Work Category	Response Time (days,)	
	Access	Low Volume
Potholes	5	5
Grading	3	5
Pavement failure repairs	In programme	In programme
Supply and placement of maintenance aggregate	2	5

7.4.9. FINANCIAL

The Roading asset components were valued as follows, as at 30th June 2020. Data was sourced from the MDC Annual Report 2020 and includes all (sealed & unsealed) land and formation.

Table 40: Asset Valuation – All Roads (2020)

ASSET VALUATION – ALL ROADS (2020)			
Item	Optimised Replacement Cost ($)	Optimised Depreciated Replacement Cost ($)	Annual Depreciation ($)
Land	87,106,136	87,106,156	0
Formation	290,945,911	290,945,891	0
Pavement	103,231,684	74,046,020	1,938,766
Shoulders	8,804,906	5,848,935	116,257
Sealed Surfacing	28,040,017	14,443,980	981,977

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 annual reports.

7.4.10. HISTORICAL EXPENDITURE

Historical expenditure on unsealed road assets from previous years is summarised in Table 41, Data is sourced from financial reports.

Table 41: Historical Expenditure – Unsealed Roads

HISTORICAL EXPENDITURE – UNSEALED ROADS			
Year	Renewal Expenditure ($)	Cost of Maintenance ($)	Total Spend ($)
2017-18	838501	373173	1211674
2018-19	1006725	505597	1512322
2019-20	561774	587248	1149022
2020/21 (forecast)	738600	528500	1267100

With the inclusion of renewal only in the last 10 years analysis of historical the expenditure costs show that the average cost per annum of maintaining one kilometre of unsealed carriageway in the network over the past seven years is: $3,709.86

TEN-YEAR FORECAST				
Year	Approximate Expenditure ($ '000)			
	Renewal	Maintenance	Total	BERL inflation forecast %
2021 – 22	1035.0	610.9	1645.9	0.8
2022 – 23	1069.2	631.1	1700.3	3.3

TEN-YEAR FORECAST				
Year	Approximate Expenditure ($ '000)			
	Renewal	Maintenance	Total	BERL inflation forecast %
2023 – 24	1102.3	650.7	1753.0	3.1
2024 – 25	1134.3	669.5	1803.8	3.0
2025 – 26	1167.2	688.9	1856.1	2.9
2026 - 27	1201.1	708.9	1910.0	2.9
2027 - 28	1235.9	729.5	1965.4	2.9
2028 – 29	1271.7	750.6	2022.3	2.9
2029 - 30	1308.6	772.4	2081.0	2.9
2030- 31	1346.6	794.8	2141.4	2.9

7.4.11. 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.

7.4.12. ASSET ACQUISITION AND CREATION PLAN

Asset creation in relation to unsealed roads includes:

1. Road reconstruction
2. Minor improvements
3. Road improvements

MDC's asset creation strategy is:

- To prioritise works in descending order of Benefit/Cost (B/C)
- To carry out works where 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 NZTA's 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 planed for the unsealed road network other than small isolated projects as listed above.

Seal extension need is determined by economic analysis. Where NZTA funding criteria cannot be met Council's seal extension policy applies. Dust suppression products are applied to unsealed pavements on a needs basis as a maintenance activity.

7.4.13. PROGRAMME

The unsealed roads require routine maintenance to maintain the required level of service. Table 42 shows that the annual renewals expenditure for this asset is forecast to increase in future as outlined in the programme Business case.

NZTA currently provides 58% of the cost of maintenance, renewal and upgrading of unsealed pavement assets. The remaining portion of expenditure is funded from rates.

Table 42: Unsealed Roads, Renewal & Capital Costs Identified

UNSEALED ROADS MAINTENANCE, RENEWAL & CAPITAL COSTS IDENTIFIED			
Action/Work & Driver	Estimated Cost ($000)	Scheduled For	How this will be funded
Increase renewal and replacement of unsealed road assets as part of strengthening maintenance.	$1,035 $1,069 $1,102	2021 2022 2023	This cost will be. Funded from NZTA subsidy, rates and depreciation.
Condition assessment and compliance with standards.		2024 and ongoing	

**Note – the work sites listed are provisional only and will be confirmed by the Project Manager prior to each year's activity.*

Table 43: Unsealed Road Rehabilitation Programme

UNSEALED REHABILITATION PROGRAMME												
Road_Name	RP_Start	RP_End	Length	Cost	Programme_$							
					2020-21	2021-22	2022/23	2023/24	2024/25	2025/26	2026/27	Future
Bute Rd	1280	1860	580	$161		161						
Bute Rd	1860	4200	2340	$650				325	325			
Ngahape Rd	5180	5410	230	$49				49				
Ngahape Rd	6710	8800	2090	$442		442						
Ngahape Rd	10800	12040	1240	$276		276						
Mikimiki Rd	3200	8000	4800	$1,350						$450	$450	$450
Mungapurupuru	3900	5200	1300	$407	$407							
		Total Costs Unsealed Roads			407	879		374	325	450	450	450

7.5. 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.

7.5.1. 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 Roading drainage assets.

7.5.2. 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 44

The stormwater assets recorded in the second table are from the Councils 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 Roading Asset Management Plan.

Table 44: Drainage Assets Summary

DRAINAGE ASSETS SUMMARY			
Roading Drainage Items	Total (m)	Urban Stormwater Items	Total
Dished Channel (Concrete)	1770m	Stormwater manholes	65
Kerb & Channel (Concrete)	187361m	Watercourses	96,283m
Kerb & Dished Channel (Concrete)	140m	Soak pits	96
Kerb only (concrete)	918m	Stormwater pipes	46,116m
Mountable Kerb & Channel (concrete)	11983m		
Mountable Kerb only (concrete)	133m		
SWC (Deep, >200 Below Seal Edge)	814387m		
SWC (Shallow, <200 Below Seal Edge)	141807m		
Catch pits	1548		
Culverts (length)	37503m		
Subsoil drain	5503m		

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 45: Drainage Assets - Material & Size

DRAINAGE ASSETS - MATERIAL & SIZE		
Item	Diameter range	Length (m)
Asbestos cement	225-500	414
Concrete	100-5,000	34497
Earthenware	125-375	253
HDPE	125-600	294
Poly Vinyl Chloride	50-480	314
Steel	225-1,200	1688
Stone	600-1200	17
Timber construction	300-425	26
Total		**37503**

The general life expectancy of concrete drainage control facilities is considered to be in the range of 80 to 100 years depending on the type of facilities.

7.5.3. VEHICLE CROSSINGS – (BRIDGE CROSSINGS)

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 & 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
	

7.5.4. 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 46 and Table 47 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 46: Water Channel – Condition

SURFACE WATER CHANNEL – CONDITION				
Item	Total length	Inadequate channel capacity (m/%)		Blocked channel obstruction (m/%)
Surface Water Channel	874.5 km	111/0.01 %		219/0.03%

Table 47: Kerb & Channel – Condition

KERB & CHANNEL – CONDITION					
Item	Total length	Blocked channels (m/%)	Broken surfaces (m/%)	High Lips (m/%)	Uphill Grade (m/%)
Kerb & Channel	202.3 km	56/0.03 %	2896/1.43 %	1585/0.78 %	7037/3.48 %

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 & 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 & 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.

7.5.5. CRITICAL ASSETS

All drainage control assets are considered critical in providing an effective drainage system to promote safety and reduce risks such as flooding.

The significant negative effects of the drainage control network in the Masterton district are outlined in Table 48

Table 48: Significant Negative Effects of Drainage Control Services

SIGNIFICANT NEGATIVE EFFECTS OF DRAINAGE CONTROL SERVICES		
	Negative Effects	How We Will/Do Mitigate
Social	Under-sized or poorly maintained culverts could cause flooding, resulting in isolation of communities; flooding and associated health risks etc.	Routine maintenance plus renewal and replacement programmes
Cultural	None identified	N/A
Environmental	Under-sized or poorly maintained culverts could cause flooding and consequently damage to the environment.	Routine maintenance plus renewal and replacement programmes
Economic	Inadequate asset management planning could result in flooding, which has an economic impact on the community e.g. damage to property and crops.	Implementing and developing asset management systems and processes

7.5.6. 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.

7.5.7. 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.

7.5.8. 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.

7.5.9. FINANCIAL

The Drainage asset components were valued as follows, as at 30th June 2020. Data was sourced from the MDC Annual Report 2020.

Table 49: Asset Valuation – Drainage (2020)

ASSET VALUATION – DRAINAGE (2020)			
Component	Replacement Cost ($)	Depreciated value ($)	Annual Depreciation ($)
Surface Water Channels, Kerbs & Channels	23,928,930	13,148,027	239,028
Culverts (Box)	14,472,527	4,916,953	112,161
Culverts (Pipe)	23,871,865	14,929,574	265,819

Historical expenditure on drainage control assets from previous years is as summarised in Table 50 Data is sourced from financial reports.

Table 50: Historical Expenditure – Drainage

HISTORICAL EXPENDITURE – DRAINAGE			
Year	Renewal Expenditure ($)	Cost of Maintenance ($)	Total Spend ($)
2017-18	169654	287763	457417
2018-19	469734	366652	836386
2019-20	276472	558217	834689

HISTORICAL EXPENDITURE – DRAINAGE			
Year	Renewal Expenditure ($)	Cost of Maintenance ($)	Total Spend ($)
2020-21 (forecast)	543300	485000	1028300

7.5.10. 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 assets (excluding culverts). The most recent report from June 2020 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 11 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. 0.8km) for kerb renewal but this is not necessarily where bridges will be removed.

7.5.11. 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.

7.5.12. PROGRAMME

There has been significant renewal expenditure for this asset over the last five years with a planned increase in renewal work in 21/22 from CBD renewal work.

WORK CATEGORY		PROGRAMME		
		2021/22	2022/23	2023/24
113	Routine Drainage Maintenance	$567,800	$586,600	$604,800
213	Drainage Renewals	$1,028,900	$523,500	$536,700

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

7.6. 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.

7.6.1. 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

7.6.2. 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 51

Data was originally sourced from individual bridge files and spread sheets.

Table 51: Bridges Summary

ASSET SUMMARY - BRIDGES	
Bridge Material Type	Number
Concrete	38
Concrete / steel /concrete	3
Concrete arch	8
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 data base. The bridge inventory is also viewable on the Councils 'Map Viewer' GIS platform through the Councils website.

The bridge data is being migrated to the NZTA bride management programme HSIMS which both holds inventory information and assists with bridge permitting for overweight loads.

7.6.3. 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.

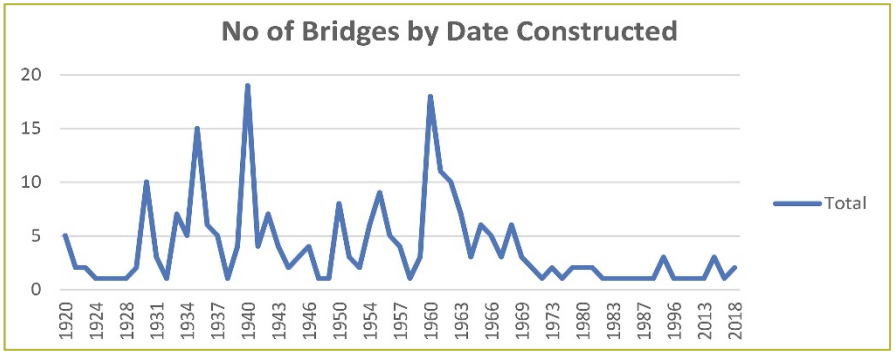
The bridge network is in generally good condition due to these regular inspections and maintenance programme. Repairs are generally made before they threaten the integrity of structures. Where the cost of repairing a structure becomes significant and uneconomic, the option of replacing the structure 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.

7.6.4. 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 34: Bridges by Construction Age



7.6.5. CRITICAL ASSETS

The Wairarapa Engineering Lifelines Project report identified bridges on important routes considered vulnerable to natural hazards. See Table 52

Table 52: 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 Rd	Earthquake
Whakatahine Bridge at M/Stronvar Rd	Earthquake

CRITICAL ASSETS - BRIDGES	
Bridge Name	Vulnerable To
Brancepeth Bridge at M/Stronvar Rd	Earthquake
Homewood bridge (old No. 7) at Homewood Rd	Earthquake

**Note - The restricted bridges affecting the roading capacity are shown below*

Table 53: 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

RESTRICTED BRIDGES

Br #	Br Name	Br Type	Posted Restriction			Priority	Work Status
			Weight	%	Speed		
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 & 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 54. Design checks to determine the work required to remove the restrictions will be programmed on some during the next three-year funding programme.

Table 54: 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
Colombo Rd	Colombo (old) – south bound	8200	100% Class 1
Miki Miki Rd	Miki Miki	8200	100% Class 1
Mangarie Rd	Mangarie No 1	8200	100% Class 1
Mungapurupuru Rd	Mangapurupuru 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. Inspection and any remedial options will be programmed during the 2021/31 years, with significant works (if any) likely to be programmed into the next three-year programme period (2021/23).

7.6.6. 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, one bridge is programmed for renewal in the 2021/24 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. Their postings have little effect on the operation of the network.

Of the 13 (5%) bridges restricted to Class 1, 1 is programmed for replacement in 2021/22, and 6 are programmed for upgrade to HPMV in the 2021/24 RLTP. 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.

7.6.7. 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.

7.6.8. 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 30 minutes 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.

7.6.9. 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 55: Bridge 30 Year Capital Expenditure Program

PROJECTED BRIDGE 30 YEAR CAPITAL EXPENDITURE PROGRAM		
Bridge name	Programmed year	Est. Cost
Te Mara Rd (Forest Home) replacement	2021-22	$180,000
Colombo Rd (sth bound) replacement	2021-22	$2.8m
Bartholomew's (Tinui Valley)	2023-24	$180,000
Glendonald	2022-23	$185,000
Maringi Road No3 upgrade for 50Max and renewal of deck	2023-24	$130,000
Pack spur No2 upgrade for 50Max and renewal of deck	2022-23	$70,000
Pack spur No3 upgrade for 50Max and renewal of deck	2022-23	$70,000
Te Mai iti upgrade for 50Max and renewal of deck	2023-24	$60,000

7.6.10. FINANCIAL

The Bridge asset components were valued as follows, as at 30th June 2020. Data was sourced from the MDC Annual Report 2020.

Table 56: 2020 bridge valuations

2020 BRIDGE VALUATIONS			
Item	Full Replacement Value ($)	Depreciated Replacement Value ($)	Annual Depreciation ($)
Bridges	88,184,085	34,234,589	838,880

7.6.10.1. Historical Expenditure

Historical expenditure from previous years is outlined in Table 57 and is sourced from financial reports.

Table 57: Historical Expenditure - Bridges

HISTORICAL EXPENDITURE - BRIDGES			
Year	Renewal Expenditure ($)	Costs of Maintenance ($)	Total Expenditure ($)
2017-18	3932	215708	219640
2018-19	7050	179238	186288
2019-20	60336	66064	126400
2020-21 (forecast)	360600*	81500	442100

*Note includes pedestrian footbridge not previously considered in bridges.

7.6.11. PROGRAMME

Expenditure for routine maintenance and inspections for bridges over the next ten years is estimated at $700,000 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.

7.7. CARRIAGEWAY LIGHTING

Street lighting is an important amenity to local communities and an essential component of the transport network.

7.7.1. 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 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 poles owned by the line company, PowerCo.

Technical issues are provided through Masterton Councils 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.

7.7.2. 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.

Council also manages streetlights on the urban State Highway 2 on NZTA's behalf.

The numbers of the streetlights by area are given in Table 58

Table 58 Streetlight type and Number

STREETLIGHTS TYPES	
Area	Total
State Highway (NZTA)	328
Urban Roading	1851
Rural Roading	87
Amenity Lights (not Subsidised) including car parks, walkways, decorative lights	131
Under verandah	314

STREETLIGHTS TYPES	
Area	Total
Parks (including community housing)	92
Total	**2803**

In 2020 NZTA initiated a move to take the state highway lighting in the urban area back under their control. MDC will no longer manage this asset for NZTA from 2021.

All LED lights have a colour temperature of 3000k as agreed with the adjoining Council's. this is in line with their 'dark skies' policy.

7.7.3. 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.

In 2020 A programme of upgrading the under verandah lighting to LED began. This due for completion in 2021 and will similarly decrease energy costs and maintenance costs.

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 god 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.

7.7.4. 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 59

Table 59: 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	

7.7.5. 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.

7.7.6. 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.

7.7.7. 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, carries out maintenance of the streetlight assets. I.

NZTA covers the full cost of maintenance and power costs for streetlights on State Highway 2 within the urban area of the district. NZTA will provide 56% subsidy by 2023/24 of total costs for operating, maintaining and upgrading street lighting assets with the exception of any amenity lighting and under verandah lighting.

7.7.8. FINANCIAL

The Lighting asset components were valued as follows, as at 30th June 2020. Data was sourced from the MDC Annual Report 2020.

Table 60: Asset Valuation – Streetlights (2020)

ASSET VALUATION – STREETLIGHTS (2020)			
Item	Full Replace Value ($)	Depreciated Replace Value ($)	Annual Depreciation ($)
Streetlights	5,201,508	2,508,437	142,398

Historical expenditure on streetlight assets from previous years is summarised in Table 61. Data is sourced from financial reports.

Table 61: Historical Expenditure - Streetlights

HISTORICAL EXPENDITURE - STREETLIGHTS			
Year	Cost of Renewal($)	Cost of Maint ($)	Total Cost ($)
2017-18	53241	121916	175157
2018-19	27356	6090	96446
2019-20	24555	64948	89503
2020-21 (forecast)	34000	64300	98300

7.7.9. 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 laminar 30 years. The LED fitting has an expected life of 100,000 hours.

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.

7.7.10. 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.

7.7.11. PROGRAMME

Council has made a strategic decision to 'at least' maintain the current levels of service for this activity.

7.7.12. DISPOSAL PLAN

Council has no current plans to dispose of street lighting assets.

7.8. TRAFFIC FACILITIES & GUARDRAILS

The network of signs and road markings provides for safe and efficient wayfinding and movement across Masterton's transport network.

7.8.1. 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.

7.8.2. 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'.

7.8.2.1. Road Signs

A full sign inventory is maintained in the RAMM database. New signs and any adjustments are recorded in the RAMM contractor's module of 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 62: 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

SIGN INVENTORY							
Sign type	Excellent	Good	Average	Poor	Very poor	Unknown	Total
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

7.8.2.2. 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 63: 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
Stop controls	Each	22
Pedestrian crossings	Each	26
Car park marking	Each	1571
Raised pavement markers	Each	4836
Misc. words & symbols	Each	680.5

The maintenance contractor currently undertakes the road marking works using sub-contractors.

7.8.2.3. 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.

7.8.2.4. 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.

7.8.2.5. 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 eight roundabouts in Masterton district. Four 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.

7.8.2.6. Guardrails

There are 4.8km of timber sight rails, and 2.4km 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 guardrails proposed for installation at Goodland's and Te Kanuka Bridges in the next 3-year programme, based on the Masterton Castlepoint Rd safety audit completed in 2018.

Table #: Guardrail Inventory

GUARDRAIL INVENTORY		
Item	Quantity	Length (m)
Guardrail	58	2397
Timber sight rail	401	4866

7.8.3. 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.

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.

7.8.4. 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 & 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 64.

Table 64: 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

7.8.5. 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.

7.8.6. DESIGN STANDARDS

Generally, 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.

7.8.7. 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 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.

7.8.8. 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.

7.8.9. FINANCIAL

The Traffic Service asset components were valued as follows, as at 30th June 2020. Data was sourced from the MDC Annual Report 2020.

Table 65: Asset Valuation – Traffic Services (2020)

ASSET VALUATION – TRAFFIC SERVICES (2020)			
Type	Full Replacement Value ($)	Depreciated Replacement Value ($)	Annual Depreciation ($)
Signs	784,548	312,904	77,815
Reflective Markers	93,718	72,918	8,759
Paint Marking	969,730	663,374	484,865
Traffic Islands	988,432	652,300	19,876
Road Structures (retaining walls etc.)	3,462,396	2,263,317	70,030

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 Table 66. Data is sourced from financial reports.

Table 66: Historical Expenditure – Traffic Services

HISTORICAL EXPENDITURE – TRAFFIC SERVICES			
Year	Renewal Expenditure ($)	Costs of Maintenance($)	Total Expenditure($)
2017-18	120607	79019	199626
2018-19	660020	155073	815093
2019-20	420613	95905	516518
2020-21 (forecast)	519300	91900	611200

**Road marking redefined as renewal expenditure.*

7.8.10. 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 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.

7.8.11. 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.

7.8.12. 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 67.

NZTA will provide 56% subsidy by 2023/24 of 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.

Table 67: Traffic Services Maintenance, Renewal & Capital Costs Identified (excluding street lighting)

TRAFFIC SERVICES MAINTENANCE, RENEWAL & CAPITAL			
Work and Driver for Action	Estimated Cost	Scheduled For	How this will be funded
Maintenance of assets	$92,000 p.a. Increasing by $40k per year for 6 years due to additional delineation	Per annum	This cost will be. funded from NZTA subsidy and, rates.

TRAFFIC SERVICES MAINTENANCE, RENEWAL & CAPITAL			
Work and Driver for Action	Estimated Cost	Scheduled For	How this will be funded
Renewal of assets	$160,000 pa Increasing by $40k per year for 6 years due to additional delineation	Per annum	This cost will be. funded from NZTA subsidy and, rates
Additional delineation as part of the delineation strategy and implementation (funded from LCLR programme)	$200k pa for 6 years	2021-2027	This cost will be. Funded from NZTA subsidy and, rates

7.8.13. DISPOSAL PLAN

Council has no current plans to dispose of traffic services assets.

7.9. FOOTPATH AND PEDESTRIAN CROSSINGS

Masterton's footpaths are a key link between a journeys 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.

7.9.1. 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 & 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.

7.9.2. ASSET DESCRIPTION (INC. HOW ASSET DATA IS STORED)

Council currently maintains about 208.091km 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 68: Footpath Surfacing

FOOTPATH SURFACING	
Material	Total (m)
Asphaltic concrete	83182
Concrete	50073
Interlocking blocks	1500
Metal (crushed lime)	7995

FOOTPATH SURFACING	
Material	Total (m)
Seal	64830
Slurry Seal	511
Total	208091

A complete inventory of footpath condition ratings is managed using the road asset management system (RAMM), which contains both physical attributes and condition data.

7.9.3. 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 10mml 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 69: Footpath condition rating

FOOTPATH CONDITION RATING			
Condition assessment		Km	%
1	Very Good (as new)	14.7	7.4%
2	Good (minor defects)	61.3	16.4%
3	Fair (maintenance required)	105.6	53.3%
4	Poor (significant maintenance required)	2.7	8.1%
5	Very Poor (Renewal or rehabilitation required)	0	

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 very good 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.

7.9.4. AGE DISTRIBUTION AND LIFE

The assessed useful life of various footpath surfaces is shown below, and consideration is being given to extending the life expectancy of AC paths out to 25 years. This Plan will be updated accordingly if the Council proceeds with the change.

Table 70: Life Expectancy of Different Footpath Surfaces

LIFE EXPECTANCY OF DIFFERENT FOOTPATH SURFACES					
Type	AC	Chip seal	Concrete	Metal	Slurry
Life Expectancy (yr.)	25	10 (1st coat) 15 (2nd coat)	60	40	15

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 71: Age of footpath surface

AGE OF FOOTPATH SURFACE				
Surface	Age of Surface			Total m
Type	< 10 years	>10 years <20 years	>20 years	
Asphaltic Concrete	45787	22628	15,28114767	83182
Concrete	12649	8,17711107	26317	50073
Interlocking Pavers	69	0	1,431	1,431
Crushed Lime	6817	1178	0	7995
Seal	900	45976	11,82617954	64830
Slurry	0	0	511	511
Total				208091

A schematic of the Masterton urban area showing indicative ages is attached in the appendices as Appendix 4 Footpaths by Age.

7.9.5. 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 72.

Table 72: 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	Review and improve current practices Prioritise renewals of footpaths Review budget levels

Significant Negative Effects of Footpath Services		
	Negative Effects	How we will mitigate
	root upheaval, poor design, construction, materials, lack of funding, & utilities reinstatements)	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

7.9.6. 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 & 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, Millard Avenue, Andrews Street, Chamberlain and Upper Plain Road,).

7.9.7. 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) an 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	Review footpaths for safety and	3-yearly	Footpaths are managed with a Lifecycle Management Plan.

Masterton, in line with our Footpath Lifecycle Management Plan	for mobility scooter access be completed in consultation with relevant community organisations		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 73.

Table 73: 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

FOOTPATH DESIGN THICKNESS			
Footpath Type	Base thickness (mm)	Surface thickness (mm)	Total thickness (mm)
Concrete	100	100	200
Slurry	120	5 – 8	125 - 128
Metal	120	Nil	120

7.9.8. 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 48 hours 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.

7.9.9. 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

7.9.10. 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

7.9.11. FINANCIAL

The Councils Footpaths asset components were valued as follows, as at 30th June 2020. Data was sourced from the MDC Annual Report 2020.

Table 74: Asset Valuation – Footpaths Etc. (2020

ASSET VALUATION – FOOTPATHS ETC. (2020)			
Item	Replacement Value ($)	Depreciated Replacement Value ($)	Annual Depreciation ($)
Footpaths	21,036,134	13,148,027	592,724
Central Area Paving	2,016,252	1,118,233	49,709
Street Furniture	1,181,931	464,493	53,486
Berms & Street Trees	7,349,410	7,349,410	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 anew 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 Table 75 Data is sourced from financial reports.

Table 75: Footpaths – Historical Expenditure

FOOTPATHS – HISTORICAL EXPENDITURE			
	Renewal Expenditure ($)	Costs of Maintenance ($)	Total Expenditure ($)
2017 – 18	0	65908	65908
2018 – 19	513337	67082	580419
2019 - 20	256802	64159	320961
2020 – 21 (forecast)	438000	82000	520000

The above figure lists the historical maintenance & renewal costs of maintaining the footpath assets.

7.9.12. 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.

7.9.13. 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. See Table 76

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.

Table 76: Footpath Maintenance, Renewal & Capital Costs Identified

FOOTPATH MAINTENANCE, RENEWAL & CAPITAL COSTS			
Work and Driver for Action	Estimated Cost $,000 pa	Scheduled For	How this will be funded
Footpath maintenance and renewals (reseals)	$510 (CBD stage 1 and based on a 100% AC surfacing program)	2021	Rates and government subsidy Depreciation Funds and loan
Condition assessment has identified need for upgrades/reseals to maintain current LOS.	$530 pa (based on a 100% hot-mix surfacing program)	2021 and ongoing	

7.10. PARKING FACILITIES

This section covers parking facilities that Masterton District Council owns and maintains.

7.10.1. 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

7.10.2. ASSET DESCRIPTION (INC. HOW ASSET DATA IS STORED)

The Council owns and maintains 1495 off-streetcar park spaces; and 1359 on-streetcar 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 77: 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.

7.10.3. ASSET CONDITION AND MONITORING

The overall condition of parking facilities is generally in order.

7.10.4. CRITICAL ASSETS

No parking spaces are considered critical.

Significant negative effects of the parking assets are outlined in Table 78

Table 78: 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.

7.10.5. ASSET CAPACITY /PERFORMANCE

The existing car parking spaces available are considered sufficient currently to enable shopping, worker, & commuter parking to park safely in the central business and urban area.

As discussed in section 4, 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 during and post Covid-19.

7.10.6. DESIGN STANDARDS

Standards described by NZTA in the Traffic Control Devices Manual, NZS 4121:2001 Design for access & 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.

7.10.7. 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.

7.10.8. FINANCIAL

The Parking asset components were valued as follows, as at 30th June 2020. Data was sourced from the MDC Annual Report 2020.

Table 79: Asset Valuation – Car Parks (2020)

ASSET VALUATION – CAR PARKS (2020)			
Item	Full Replacement Value ($)	Depreciated Replacement Value ($)	Annual Depreciation ($)
Carpark Sealed Surfaces	2,249,000	1,439,000	46,000

Carpark expenditure data is stored in the Roading operating ledger. Expenditure over previous years is summarised in Table 80. Data is sourced from financial reports.

Table 80: Historical Expenditure – Car Parking

HISTORICAL EXPENDITURE – CAR PARKING	
Year	Total Expenditure ($)
2017-18	127582
2018-19	136979
2019-20	128417
2020-21 (forecast)	135000

7.10.9. RENEWAL/REPLACEMENT

Routine maintenance and renewal works are carried out in conjunction with carriageway maintenance programmes.

7.10.10. 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.

7.10.11. 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.

Table 81: Carpark Maintenance, Renewal & Capital Costs Identified

CARPARK MAINTENANCE, RENEWAL & CAPITAL COSTS				
Work and Driver for Action		Estimated Cost	Scheduled For	How this will be funded
Carpark Reseals – to be calculated for area to be done and cost estimations	Condition Assess Maintain current levels of service	$85,000 $100,000 $40,000 pa average	2021/22 2022/23 2023/24 & forward years	Depreciation Funds – Capital Exp.
Carpark maintenance & Operations	Maintain current levels of service	$135,000 pa	Ongoing annual cost	Depreciation Funds – Capital Exp.

7.10.12. 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.

7.11 CRITICAL ASSETS

Table 83: 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,
Upper Plain Rd	Fault displacement, Flooding
Masterton – Stronvar Rd	Flooding
Manawa Rd	Flooding
Mataikona Rd	Flooding, Windstorm, Tsunami, Wildfire, Landslide

8. FINANCE

8.1. 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 & 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 2018

The intended approach to service delivery for the activities of Roading (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.

8.2. FINANCIAL STATEMENTS AND PROJECTIONS

The Draft Long-Term Plan for 2021-31 will be out for consultation in early 2021 and adopted by 30 June 2021.

8.3. HISTORICAL FINANCIAL PERFORMANCE

We summarise in the table and graphs below historical financial performance of Roading 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.

- Historical expenditure 13 years

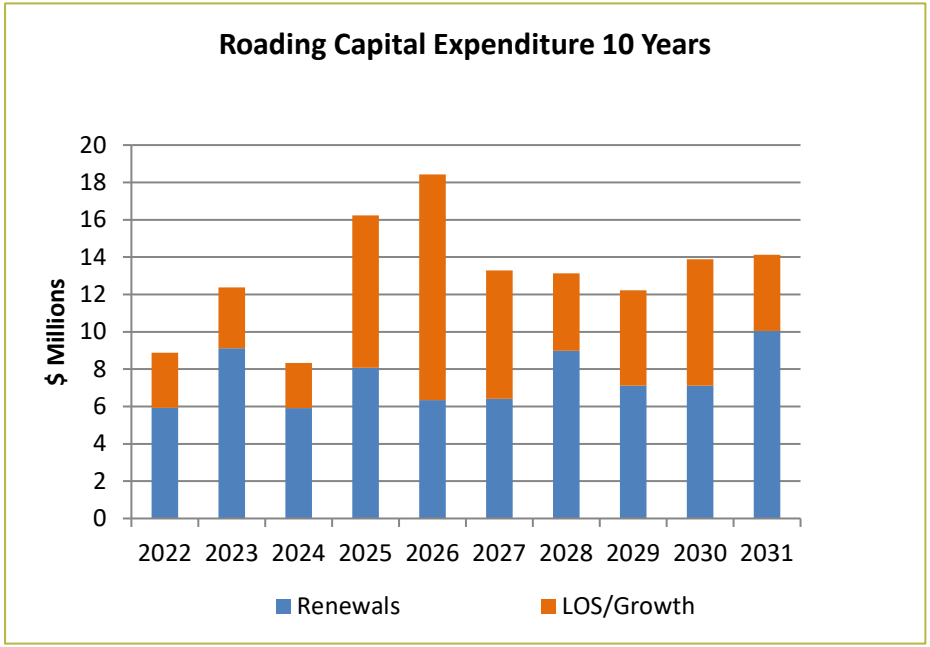
Activity	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Roading											
Operating Expenditure	9,259,471	9,515,274	9,525,408	10,056,986	9,649,581	9,899,115	9,520,051	10,713,407	11,148,209	11,799,867	14,223,395

8.4. Capital Expenditure

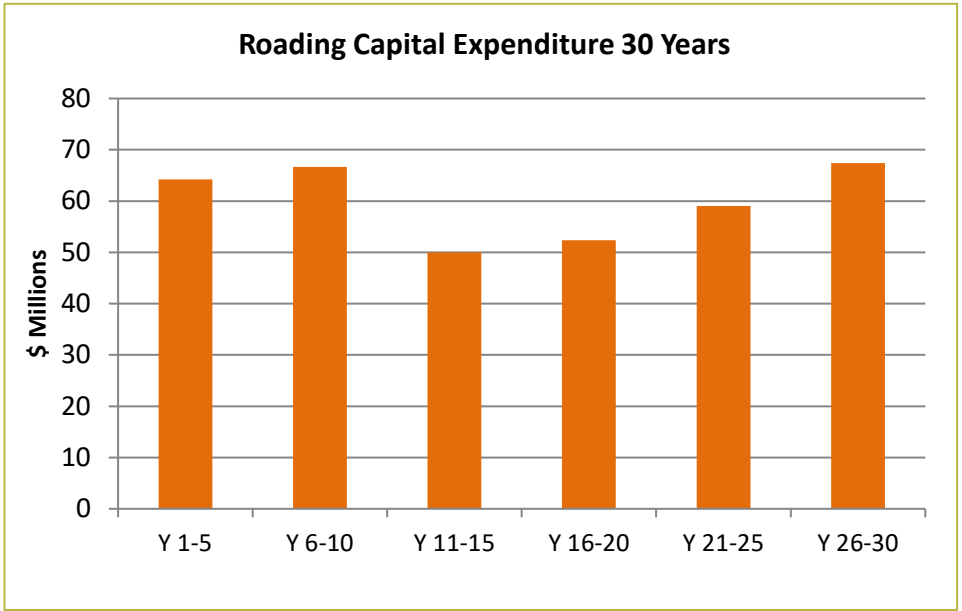
Investment in long life assets is essential to our Roading Infrastructure as it stands as a core component of our overall infrastructure and economic development.

Over the current LTP 2021-31 timeframe we are projecting to invest $135M into our Roading assets.

Summary graphs (forecasts) – 10 years



Roading Capital expenditure forecast



Roading 10-year forecast expenditure statement

ROADING	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Operating expenditure	7,475,499	7,490,231	7,931,700	8,289,524	8,614,254	9,171,013	9,742,213	10,027,145	10,362,883	10,584,068
Depreciation	6,465,022	6,998,725	7,465,882	7,900,551	8,938,023	9,524,917	9,889,545	10,863,669	11,242,187	11,563,961
Operating expenditure	13,940,521	14,488,956	15,397,582	16,190,075	17,552,277	18,695,930	19,631,758	20,890,814	21,605,070	22,148,029
Capital expenditure										
Renewals	7,939,840	9,022,159	6,367,064	8,543,723	6,827,309	6,903,378	9,488,171	7,627,551	7,646,368	8,009,420
Upgrades - los	4,255,195	4,842,262	7,154,303	8,854,212	12,024,870	6,141,080	4,872,849	3,987,180	2,225,781	2,078,235
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Operating expenditure	13.9	14.5	15.4	16.2	17.6	18.7	19.6	20.9	21.6	22.1
Operating expenditure (excl depreciation)	1.0	0.5	0.5	0.4	(0.3)	(0.4)	(0.1)	(0.8)	(0.9)	(1.0)
Depreciation	6.5	7.0	7.5	7.9	8.9	9.5	9.9	10.9	11.2	11.6
Capital & renewals expenditure	12.2	13.9	13.5	17.4	18.9	13.0	14.4	11.6	9.9	10.1
Renewals	7.9	9.0	6.4	8.5	6.8	6.9	9.5	7.6	7.6	8.0
Los	4.3	4.8	7.2	8.9	12.0	6.1	4.9	4.0	2.2	2.1
Capex report	12,195,035	13,864,420	13,521,367	17,397,934	18,852,179	13,044,458	14,361,019	11,614,731	9,872,148	10,087,654

Forecast capital expenditure summary

ROADING												
Annual Plan 2020/21	Capital Expenditure Summary	Source of Funds	LTP Year 1 2021/22	LTP Year 2 2022/23	LTP Year 3 2023/24	LTP Year 4 2024/25	LTP Year 5 2025/26	LTP Year 6 2026/27	LTP Year 7 2027/28	LTP Year 8 2028/29	LTP Year 9 2029/30	LTP Year 10 2030/31
$	**Capital Projects**		$	$	$	$	$	$	$	$	$	$
	Subsidised Roading											
2,579,160	Roading Renewals - rural	Rates & Subsidy	2,129,940	2,204,687	1,937,560	3,321,921	3,482,841	3,682,192	3,771,967	3,953,235	4,105,125	4,354,701
1,747,429	Roading renewals - urban	Depn Reserve, Rates & Subsidy	1,278,900	1,459,844	1,887,732	1,941,421	1,994,647	2,063,321	2,148,615	2,208,041	2,284,148	2,362,791
-	Roading Renewals - rural (loan funded)	Rates & Loan	1,400,000	1,225,200	1,263,600	-	-	-	-	-	-	-
-	Roading renewals - urban (loan funded)	Rates & Loan	200,000	204,200	210,600	-	-	-	-	-	-	-
115,000	Bridge renewals	Rates & Subsidy	-	204,200	-	-	223,200	-	-	243,000	-	-
672,000	Footpath upgrading [incl reseals]	Rates, Depn & Subsidy	549,000	548,583	565,777	582,971	599,627	616,820	634,551	652,820	671,625	690,968
285,000	Bridge - Waipoua River	Depn Reserve & Subsidy	285,000	3,165,100	-							
1,264,400	Rural/Urban Minor Improvement projects	Depn Reserve, Rates & Subsidy	1,293,500	1,559,373	1,051,210	1,549,163	1,593,425	1,639,114	1,686,232	1,734,777	1,784,750	1,598,241
-	Mataikona front hill upgrade	Loan & Subsidy	200,000	-	-	3,797,500	7,254,000	-	-	-	-	-
-	Masterton Revamp - subsidised portion	Subsidy & Depn Reserve	-	-	-	2,184,105	-	-	2,377,353	-	-	2,587,432
70,000	Cycleways	Rates & Subsidy	70,000	71,470	73,710	75,950	78,120	80,360	82,670	-	-	-
6,732,989	**Total Subsidised Roading**		**7,406,340**	**10,642,657**	**6,990,189**	**13,453,031**	**15,225,859**	**8,081,807**	**10,701,388**	**8,791,873**	**8,845,648**	**11,594,132**
	Non-subsidised Roading											
407,206	Carpark reseal	Depn Reserve	85,000	102,100	42,120	43,400	44,640	45,920	47,240	48,600	50,000	51,440
180,000	Under veranda lighting	Depn Reserve	70,000	-	-							
400,000	Gordon Street upgrade	Subdiv Contrib	500,000	-	-	-	-	-	-	-	-	-
50,000	Urbanisation of Millard Ave - Roading	Subdiv Contrib	15,000	-	1,196,524	783,045	-	-	-	-	-	-
10,000	CBD Recycling Bins	Depn Reserve	10,000	-	-	-	-	-	-	-	-	-
1,400,000	Masterton Revamp	Loan/Development Contributions	100,000	102,100	105,300	959,537	2,843,976	4,074,952	2,386,877	3,374,265	4,445,716	2,479,711
120,000	Neighbourhood Planning - provision	Rates /Reserves	-	-	-	-	-	-	-	-	-	-
60,000	Carpark Lighting - safety initiative	Subdiv Contrib	17,792	-	-	-	-	-	-	-	-	-
-	What's Our Welcome- North Entrance	Loan	231,000	-	-	997,115	-	-	-	-	-	-
-	What's Our Welcome- South Entrance	Loan	121,000	255,250	-	-	311,386	1,077,985	-	-	-	-
-	What's Our Welcome- Western Railway Connection Entrance	Loan	-	-	-	-	-	-	-	-	481,250	-
-	What's Our Welcome- Eastern Coastal Connection - trees	Loan	-	-	-	-	-	-	-	-	62,500	-
-	Chamberlain Rd upgrade	Subdiv Contrib	325,000	663,650	-	-	-	-	-	-	-	-
-	Kitchener to Gordon - link road	Subdiv Contrib	-	612,600	-	-	-	-	-	-	-	-
2,627,206	**Total Non-subsidised Roading**		**1,474,792**	**1,735,700**	**1,343,944**	**2,783,097**	**3,200,003**	**5,198,857**	**2,434,117**	**3,422,865**	**5,039,466**	**2,531,151**
9,360,195	**Total**		**8,881,132**	**12,378,357**	**8,334,133**	**16,236,127**	**18,425,862**	**13,280,664**	**13,135,505**	**12,214,738**	**13,885,114**	**14,125,284**
	Capital Funding											
(3,837,804)	NZ Transport Agency subsidy (roading)		(2,933,257)	(4,938,864)	(2,772,119)	(7,533,697)	(8,526,481)	(4,525,812)	(5,992,777)	(4,923,449)	(4,953,563)	(6,492,714)
(2,045,146)	Transfers from reserves		(1,576,912)	(3,052,035)	(1,076,869)	(1,474,233)	(44,640)	(45,920)	(1,093,275)	(48,600)	(50,000)	(1,189,910)
(1,460,000)	Loan funds		(1,380,000)	(1,172,108)	(1,409,462)	(3,940,770)	(6,347,123)	(5,152,937)	(2,386,877)	(3,374,265)	(4,989,466)	(2,479,711)
(7,342,949)	**Total other funding**		**(5,890,169)**	**(9,163,008)**	**(5,258,450)**	**(12,948,700)**	**(14,918,244)**	**(9,724,669)**	**(9,472,929)**	**(8,346,314)**	**(9,993,029)**	**(10,162,336)**
$2,017,246	**Rates Requirement (Capital)**		**$2,990,963**	**$3,215,350**	**$3,075,683**	**$3,287,427**	**$3,507,618**	**$3,555,995**	**$3,662,575**	**$3,868,424**	**$3,892,085**	**$3,962,948**

8.5. Funding Strategy

The Council has adopted a Revenue & Financing Policy which defines how each activity of the Council will be funded. For funding purposes, the Roading 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.

8.5.1. MASTERTON DISTRICT COUNCIL'S FARS FOR 2021-24 NLTP

The subsidised programme will transition from 58% to 56% in 2023/24 see Table 82Table 82. No NZTA funding is available for expenditure on non-subsidised programme work.

Table 82: MDC FAR rates

2021/22 FAR	2022/23 FAR	2023/24 FAR	End Transition FAR
58%	57%	56%	56%

8.5.2. 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 volumes.
- Petroleum taxes
- Loan Finance – Loan finance for identified capital improvements.
- Depreciation reserves
- Roading Rates – a Targeted Uniform Charge set differentially in rural and urban wards, charged on each property.
- Roading Rate – a targeted Land Value Rate set differentially in the rural and urban wards.
- Allocation of the Subsidised Roading 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.

8.5.3. 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.

8.5.4. ASSET VALUATION

The values listed in the Council's 2020/21 Annual Report were revalued as at 30 June 2020, 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 8.4 2020 Roading Infrastructure Asset Values

Location	Description	2014 Value (ORC)	2014 Value (ODRC)	2017 Value (ORC)	2017 Value (ODRC)	2020 Value (ORC)	2020 Value (ODRC)
Roading	Bridges	53,189,242	23,368,233	57,311,000	24,300,000	88,184,085	34,234,589
Roading	Culverts (Box)	11,475,537	5,078,236	12,135,00	5,158,000	14,472,527	4,916,953
Roading	Culverts (Pipe)	18,487,233	4,851,252	19,607,000	5,821,000	23,871,865	14,929,574
Roading	Kerb & channel	19,786,746	11,932,892	20,852,000	11,682,000	23,928,930	13,148,027
Roading	Land	84,951,358	84,951,358	85,157,000	85,157,000	87,106,136	87,106,156
Roading	Formation	254,159,100	254,159,100	269,633,000	269,633,000	290,945,911	290,945,891
Roading	Pavement	90,655,283	76,544,483	95,758,000	68,018,000	103,231,684	74,046,020
Roading	Seal	26,558,467	15,801,695	29,171,000	11,682,000	28,040,017	14,443,980
Roading	Retaining walls & Guard rails	2,192,254	1,590,311	2,543,000	1,809,000	3,462,396	2,263,317
Roading	Reflective markers	11,656	5,828	12,000	6,000	93,719	72,918
Roading	Paint markings	156,882	78,441	166,000	83,000	969,730	663,374
Roading	Traffic islands	779,198	614,180	918,000	680,000	988,432	652,300
Roading	Shoulders	6,958,516	5,297,392	7,934,000	5,688,000	8,804,906	5,848,935

Roading	Signage	947,617	487,135	965,000	274,000	784,548	312,904
Roading	Streetlights	4,424,812	1,830,337	4,913,000	1,349,000	5,201,508	2,508,437
Urban	Street trees	330,391	330,391	6,798,000	6,798,000	7,349,410	7,349,410
Urban	Berms	6,042,513	6,042,513				
Urban	Car parks	2,017,149	1,227,087	2,249,000	1,439,000	2,673,201	1,445,808
Urban	Carpark signage	16,394	8,197	12,135	N/A	N/A	N/A
Urban	Footpaths	13,225,476	10,241,204	17,802,000	10,566,000	21,036,134	13,326,389
CBD	Furniture	930,862	509,214	1,012,000	482,000	1,181,931	464,493
CBD	Paving	1,629,030	973,199	1,863,000	1,152,000	2,016,252	1,118,233
Airport	Sealed runway	3,617,285	3,178,217	4,054,000	3,656,000	4,264,992	3,401,044

8.6. 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.

8.7. 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.

8.8. KEY FINANCIAL FORECAST ASSUMPTIONS

8.8.1. 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 8.5 Assumptions and Uncertainties about Financial Provision

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
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:		
2	Historic costs, existing and proposed operating procedures	Medium	Contract rates vary by +/- 15%
	Open tendering of Roading Maintenance Contract and other Roading contracts	Medium	Contract rates may vary by up to + 15%
3	Based on the current condition of the roading 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

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
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.
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	Low	If customers' expectations increase significantly, additional funding will be required to meet the demand.

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
	An Engaged and Empowered Community		

8.9. 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 8.6 Data Confidence Level

Attribute	D	C	B	A
Historical Expenditures				
Future Growth & Demand				
Cost Fluctuation Rate				
Depreciation Fluctuation				
Operational Revenue				

Future Public Debt				
Loan Interests				
NZTA's subsidy rate				
Level of Service				

9. IMPROVEMENT PLAN

9.1. 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 prioritises so they are realistic and affordable.

9.1.1. THREE-YEAR IMPROVEMENTS

The tables that follows contain 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.

SYSTEMS				
No	Item	Current status	Year	By who
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	Eng. to Mtce Contract

EVIDENCE				
No	Item	Current status	Year	By who
3	Improve data collocation and storage	2019/20 Data Quality score 75. Some improvements required to lift data quality	Ongoing	Roading
4	Carry out deflection testing and high-speed data collection 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	2023	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.	2023	Roading
COMMUNICATING				
No	Item	Current status	Year	By who
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 who
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	Manager of Assets and operations
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	Improve and utilise Highway Structures Inventory Management System (HSIMS) to manage overweight permits, bridge inspections and structure assets database.	Currently permits are manually processed	2023	
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	2023	Assets Advisor
SERVICE DELIVERY				
No	Item	Current status	Year	By who
12	Review roading procurement strategy.	Procurement strategy has been formally endorsed effective in 2019. The strategy endorsement will expire on the 30 April 2022.	2022	Roading
13	Implement first 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 who
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 Mgr

10. APPENDIXIES LIST

10.1.1. REFERENCES

1. Asset Management Plan & Code of Service, Roading, 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 Roading 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 – Roading, 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 Roading 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 Roading 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 & Parking Assessment Report July 2010
28. Masterton District Council Roading Procurement Strategy (March 2019)

10.1.2. 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 Roading 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 – Roading (TUC), The Roading TUC is a portion of the roading 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

10.1.3. 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

Whenever you score yourself "4 or 5" think of an example you can use to justify your score to an independent auditor

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 & 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	
Number of ticks in each column					
Multiplying factor	x	x2	x3	x4	x5
Total Score in Column			6	2	3
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.

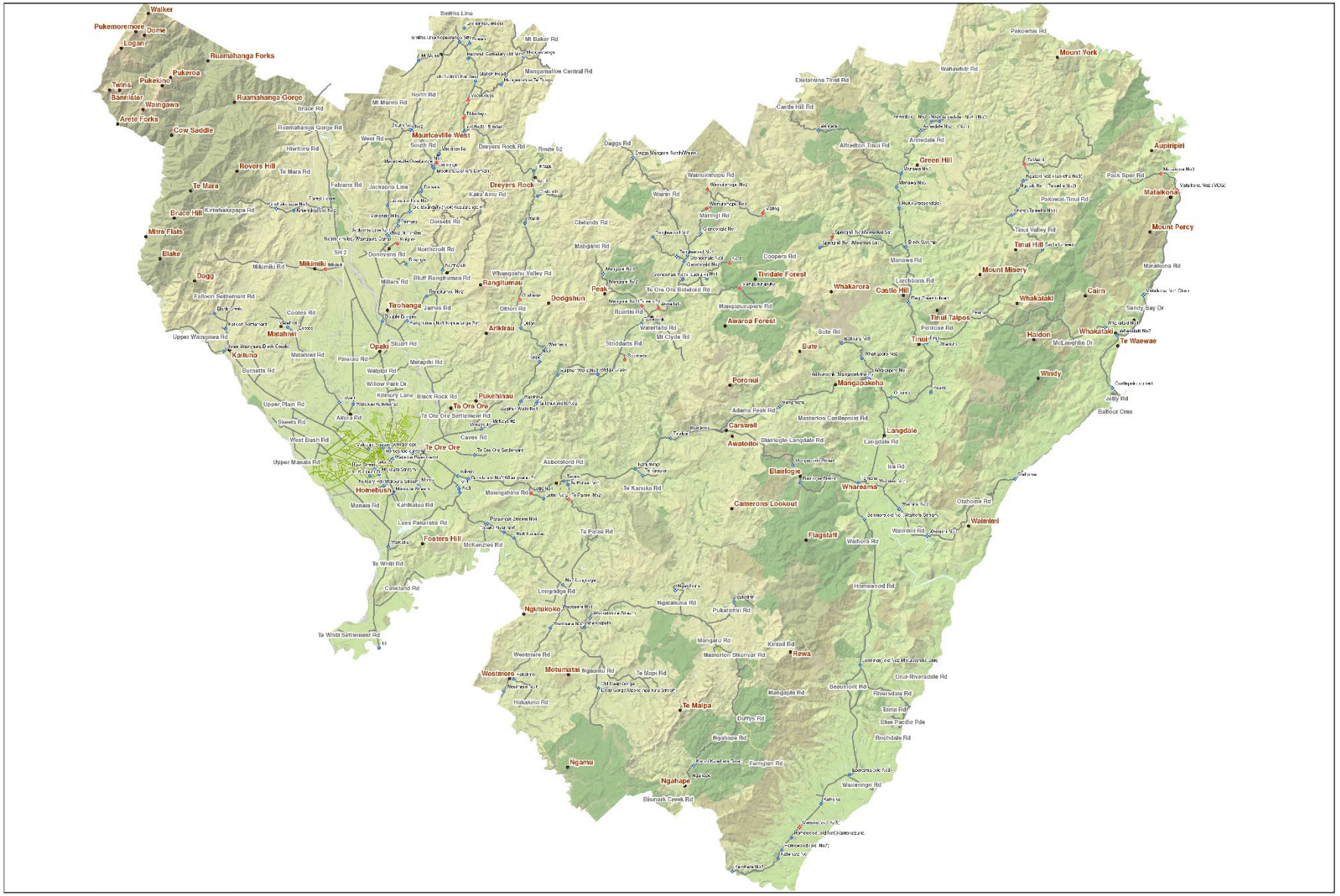
Task Force members debated the nuances around individual items in these lists but believe that they provide a platform on which to build a list of the characteristics that would be exhibited by an RCA that has the capability and the capacity to be a smart buyer.

One Task Force member described a smart buyer in the following terms:

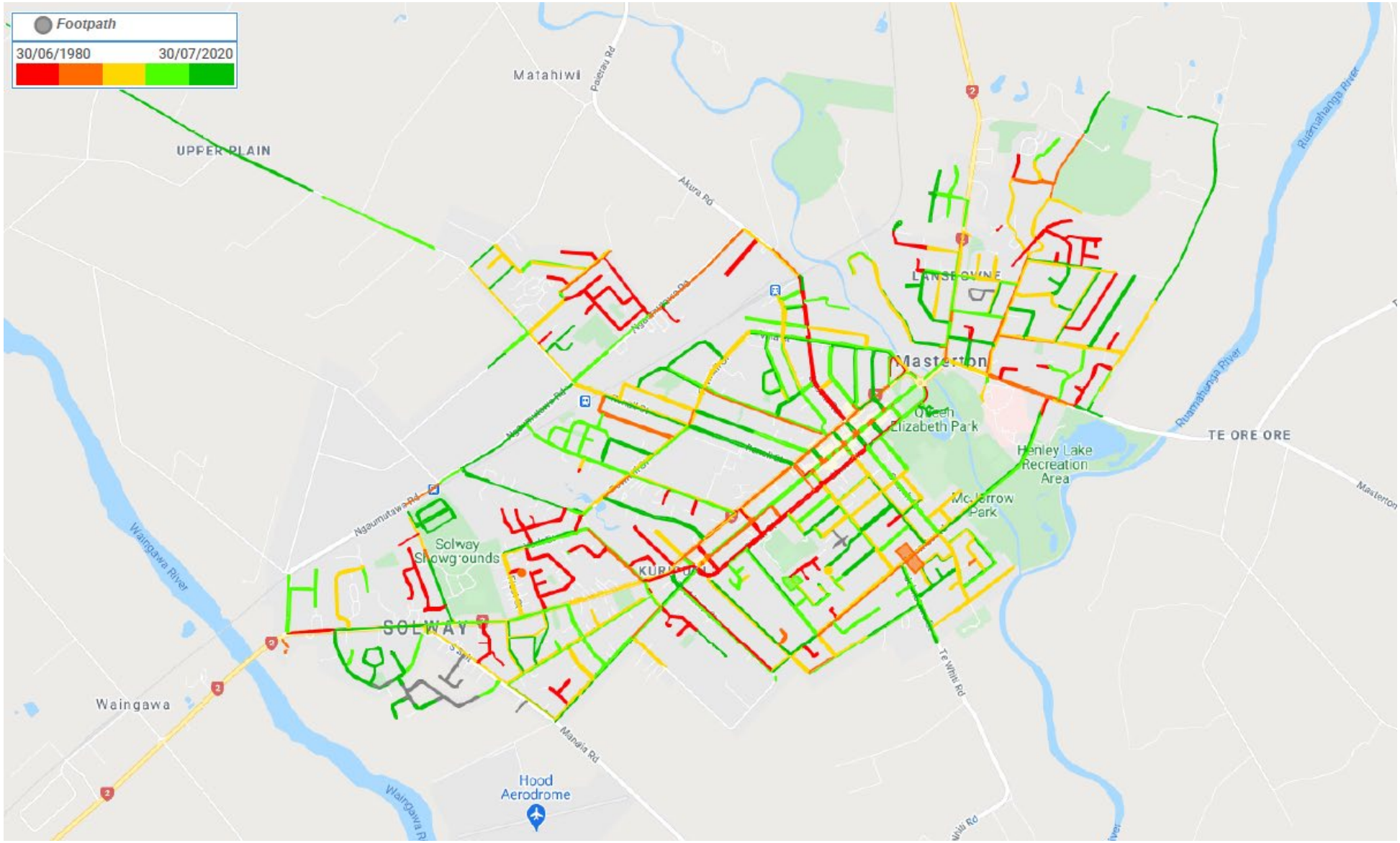
A 'smart buyer' RCA ensures its staff are up-to-date, regularly shares best practice experiences with colleagues from other agencies, and supports and resources their teams appropriately in the recognition that getting the strategic direction right is a very small cost compared to the consequence of 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?

10.1.4. APPENDIX 2 URBAN STREETS

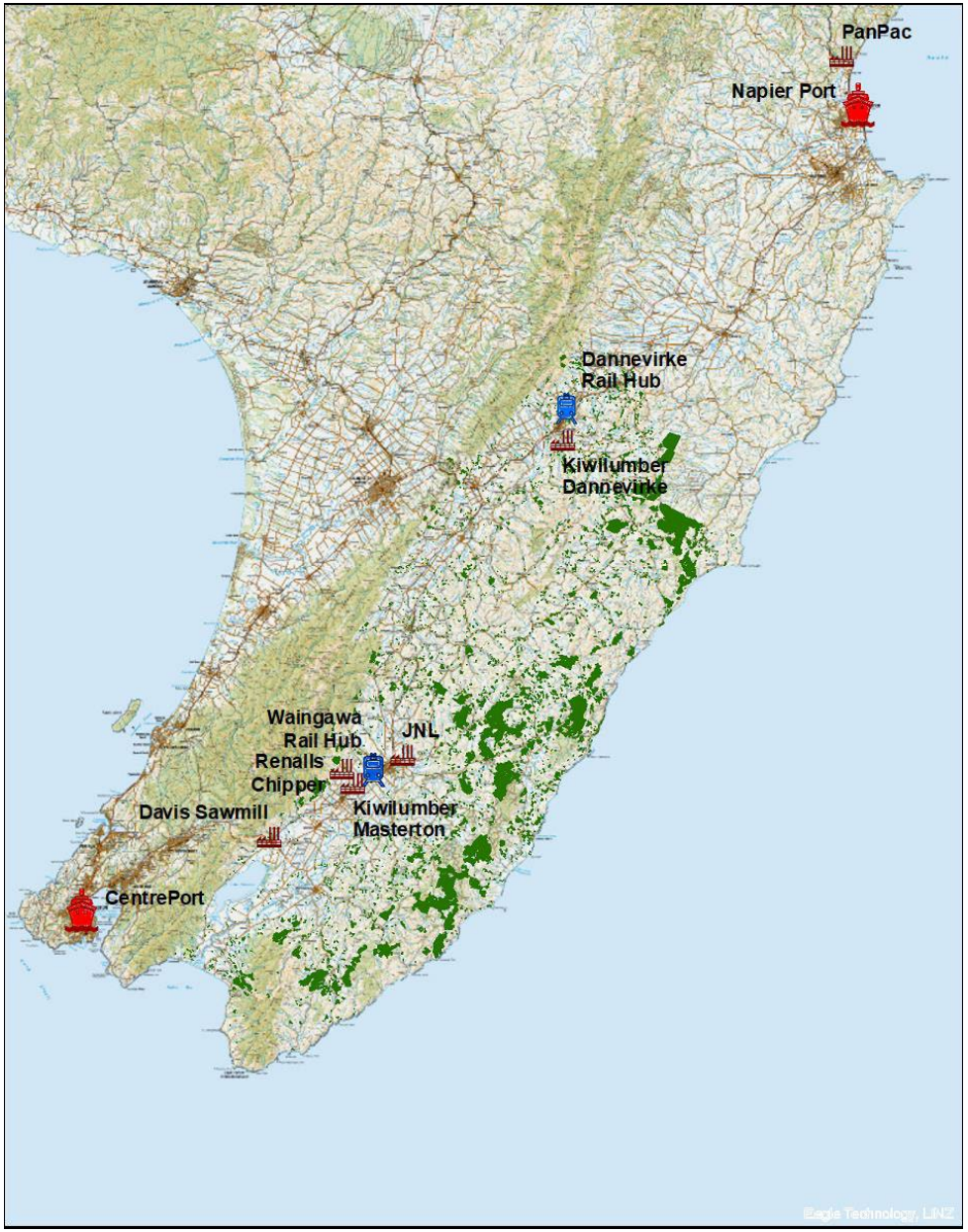
10.1.5. APPENDIX 3 RURAL ROADS



10.1.6. APPENDIX 4 FOOTPATHS BY AGE



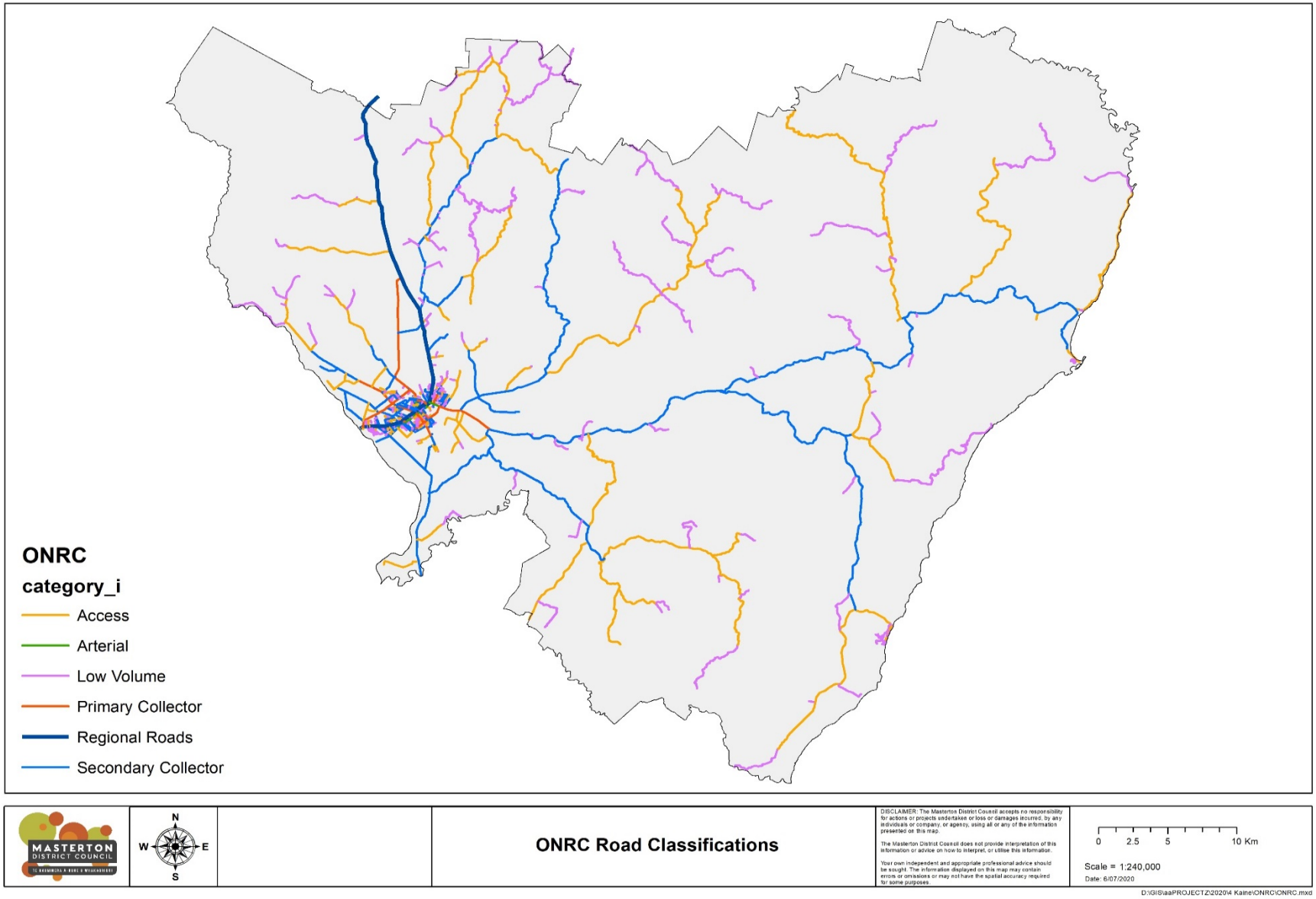
10.1.7. APPENDIX 5 FORESTY AND WOODFLOW DISTRIBUTION MAP



10.1.8. APPENDIX 7 VEHICLE CROSSING STANDARDS 805 A, B, & C

10.1.9. APPENDIX 11 CULVERT REPLACEMENT DECISION TREE

10.1.10. APPENDIX 12 ONRC CATEGORIES



10.1.11. PREVIOUS LEVELS OF SERVICE SURVEY RESULTS AND TRENDS

Roading (ex SH 2)	Very Satisfied %	Fairly Satisfied %	Not Very Satisfied %	*Very Dissatisfied %	Don't Know %
2019	No survey this year				
2018	8	55	29	7	1
2017	6	59	29	5	1
2016	10	60	28	2	0
2015	10	68	18	4	0
2014	9	70	18	3	0
2012	17	54	28		1
2011	19	56	25		0
2010	22	56	21		1
2009	20	59	20		1
2008	17	66	17		0
2007	19	61	19		1
National Average	21	54	25		-

Footpaths	Very Satisfied %	Fairly Satisfied %	Not Very Satisfied %	*Very Dissatisfied %	Don't Know %
2019	No survey this year				
2018	4	52	31	9	4
2017	5	50	32	9	4
2016	7	54	32	7	1
2015	6	54	30	7	4
2014	7	57	28	5	3
2012	14	47	37		2
2011	13	41	41		4
2010	15	47	35		3
2009	14	49	32		5
2008	14	58	21		7
2007	11	57	27		5
Peer (Province)	20	47	25		8

Parking in the CBD District	Very Satisfied %	Fairly Satisfied %	Not Very Satisfied %	*Very Dissatisfied %	Don't Know %
2019	No survey this year				
2018	11	56	26	5	2
2017	10	64	22	3	1
2016	15	62	21	2	2
2015	9	71	13	4	3
2014	9	65	20	2	3
2012	30	52	15		3
2011	21	54	23		2
2010	30	48	18		4
2009	33	51	13		3
2008	28	50	20		2
2007	22	48	29		1
Peer Group (province)	31	37	31		1
National Average	19	35	42		4