Land Transport Network
Activity Management Plan

Version 8.0

MANAWATU DISTRICT COUNCIL

Stantec

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Appendix 1 - Full Multi-Criteria Analysis

EXECUTIVE SUMMARY

1.1 Introduction

1.1.1 Our District

Manawatū District is uniquely placed in its central location as the gateway to 4 other regions: Hawkes Bay, Wairarapa, Rangitīkei and Horowhenua. 2 hours from Napier, Wellington and Mount Ruapehu, 1 hour from Masterton and 3 hours from New Plymouth and Taupō, Manawatū residents have easy access to provinces offering some of the best beaches, vineyards and adventure playgrounds this country has to offer.

More importantly, Manawatū's central location gives the region huge economic advantages. With easy access to four seaports, seven airports and major Defence Force bases, it is a highly strategic cargo, transport, and business hub for the lower North Island and the country.

The Manawatū District Council (MDC) is committed to investing in transport infrastructure - based on robust evidence - to sustain the transport network in the long term; by targeting the right treatment, to the right place, at the right time, and for the right cost.

1.1.2 Our Vision

Proudly provincial. A great place to land

Wehi nā te kāinga taurikura nei ki tuawhenua

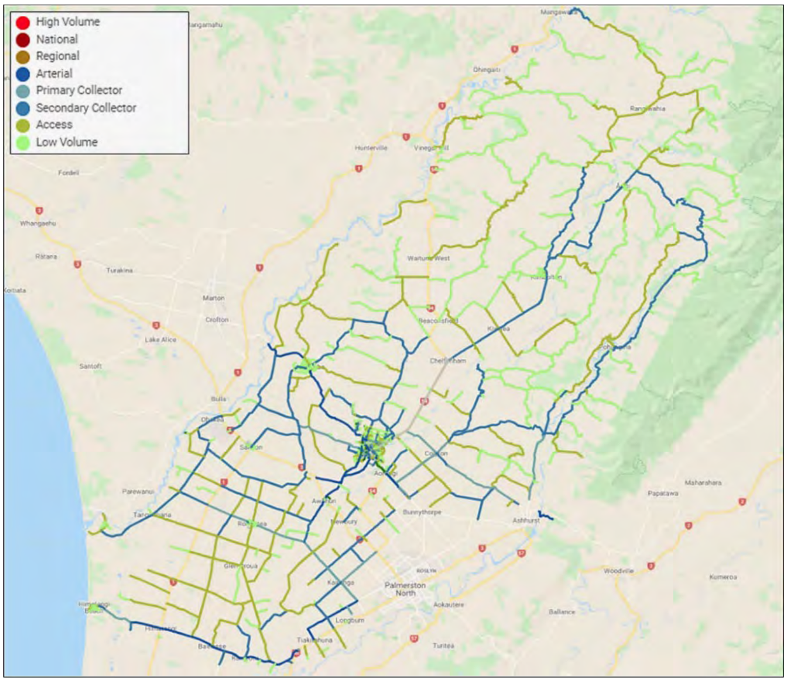
1.2 Purpose

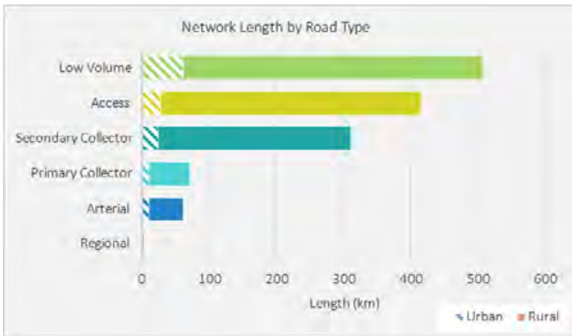
This Activity Management Plan (AMP) follows a business case approach to determine the desired level of service in the most cost-effective manner, while demonstrating responsible stewardship for present and future customers.

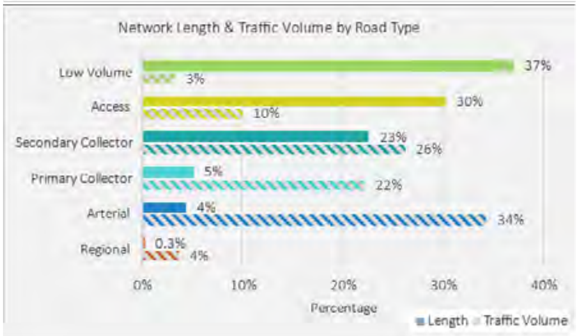
The AMP underpins the Long Term Plan (LTP) and consultative processes that have been put in place to engage the community. The primary purpose of this document is to determine the investment required on the network over this 3-year funding period, identify key risks and determine interventions, performance monitoring, and improvement priorities for the future.

1.3 Network composition

1.3.1 Key assets | Roads



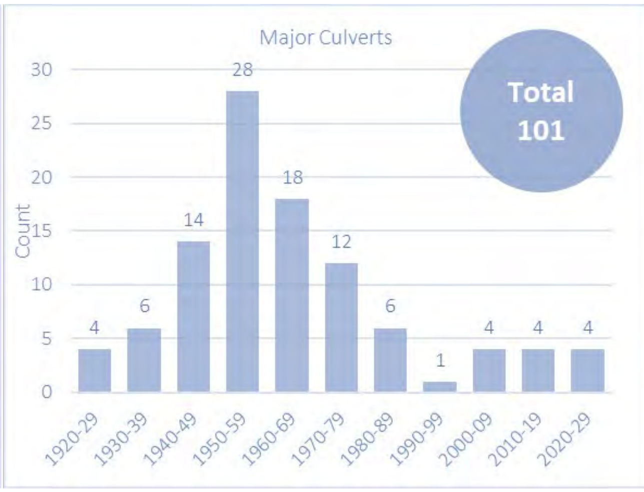




In total, Manawatū's road network comprises 1,373km, of which 1,002km (73%) is sealed and 371km (27%) is unsealed. 90% of the network consists of Low volume, Access and Secondary Collector roads, which carries 39% of the district's traffic. Approximately 90% of road length is classified rural, whilst 10% is urban.

1.3.2 Key Assets | Bridges and major culverts

Manawatū District Council owns and manages over 240 high value bridging assets, dispersed throughout its network:



Key Finding

Whilst the asset portfolio is considered to be in 'fair condition', a significant number of assets will be reaching their theoretical life at the same time. A programme of bridge renewals is required to ensure that the high cost of this peak can be smoothed out and managed appropriately. To this end, the replacement programme will prioritise condition over age.

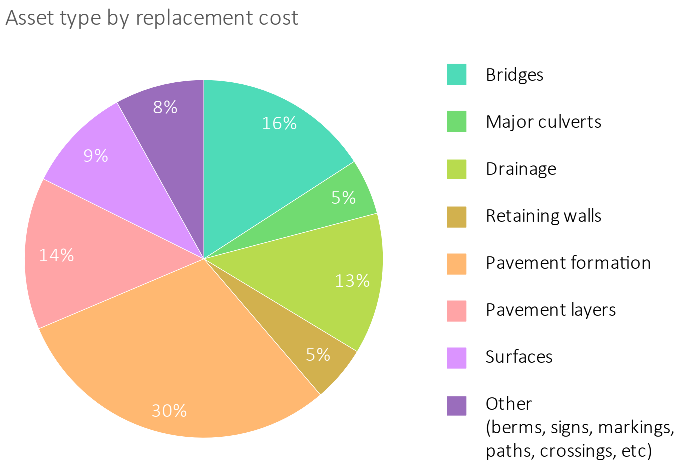
1.3.3 Network value

The latest valuation of transportation assets in July 2023 calculates the Optimised Replacement Cost (ORC) at approximately $1.16 billion; this represents the cost of replacing the Council's asset portfolio today, and demonstrates the importance of continuously managing our existing transport assets efficiently and effectively.

Replacement Cost

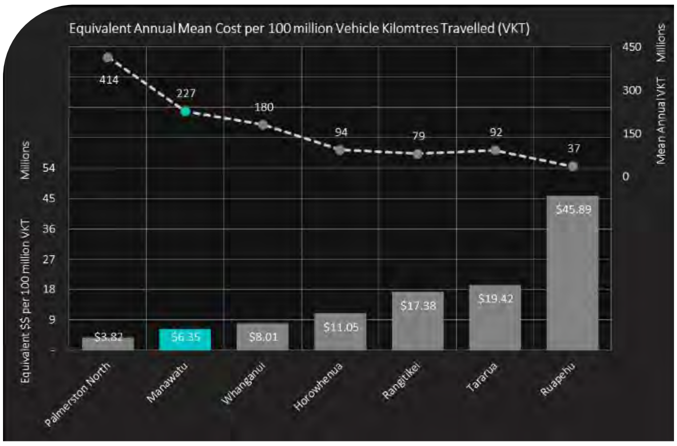
$1.16bn

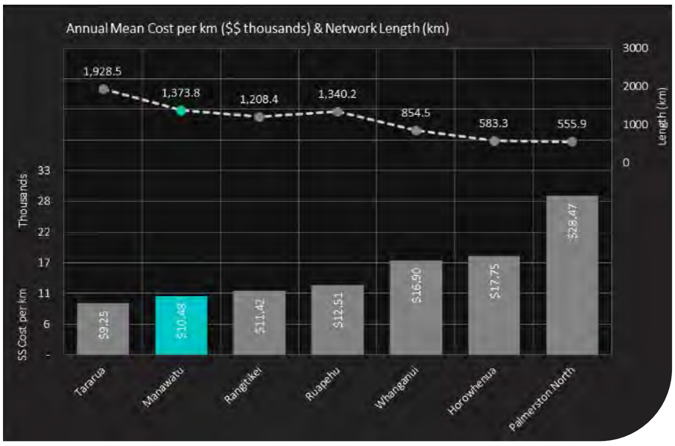
Asset Group	*Replacement Cost*	*Depreciated Replacement Cost*
Bridges	$184,355,692	$79,233,702
Major culverts	$58,769,498	$23,322,205
Drainage	$146,999,950	$45,157,320
Retaining walls	$58,944,832	$48,027,201
Pavement formation	$347,095,298	$294,322,881
Pavement layers	$159,522,690	$37,567,824
Surfaces	$111,129,319	$37,836,369
Other	$91,117,494	$54,911,015
Total	$1,157,934,773	$620,378,517



1.3.4 Fiscal Management

The cost effectiveness of MDC's latest 3 full years of maintenance, operations and renewals expenditure has been analysed using 2 metrics; traffic volume (measured in vehicle kilometres travelled, on the left) and network length (on the right):





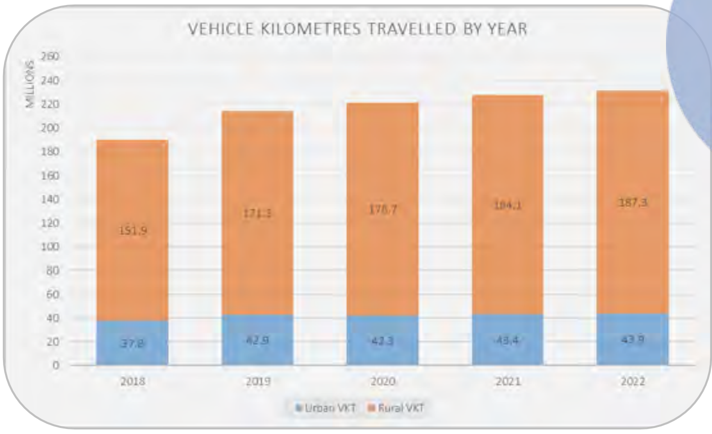
Key Finding

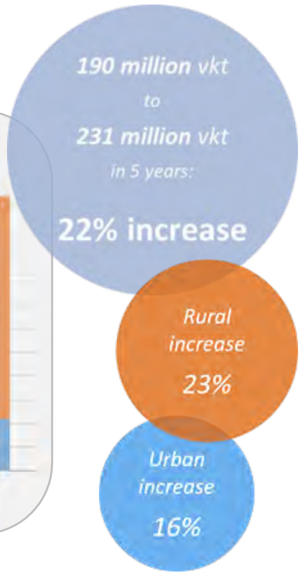
In comparison with our regional peers (Rangitīkei, Horowhenua, Tararua, Ruapehu, Whanganui, and Palmerston North), MDC's fiscal management is very effective.

1.3.5 Demand

The district's total traffic volume has increased by 22% between 2018 and 2022, with rural road traffic increasing by 23%, and urban road traffic 16%. Furthermore, traffic demand associated with forestry activities on the network is predicted to continue at peak levels until 2029.

In order to respond to future traffic demand, Council will maintain condition of the network by concentrating on core corridor related maintenance and renewal activities.





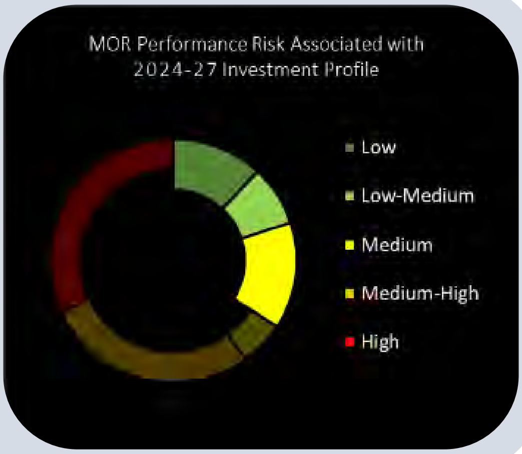
1.3.6 Condition and performance

The images below represent network condition at typical locations and environments, at present:

Key Finding

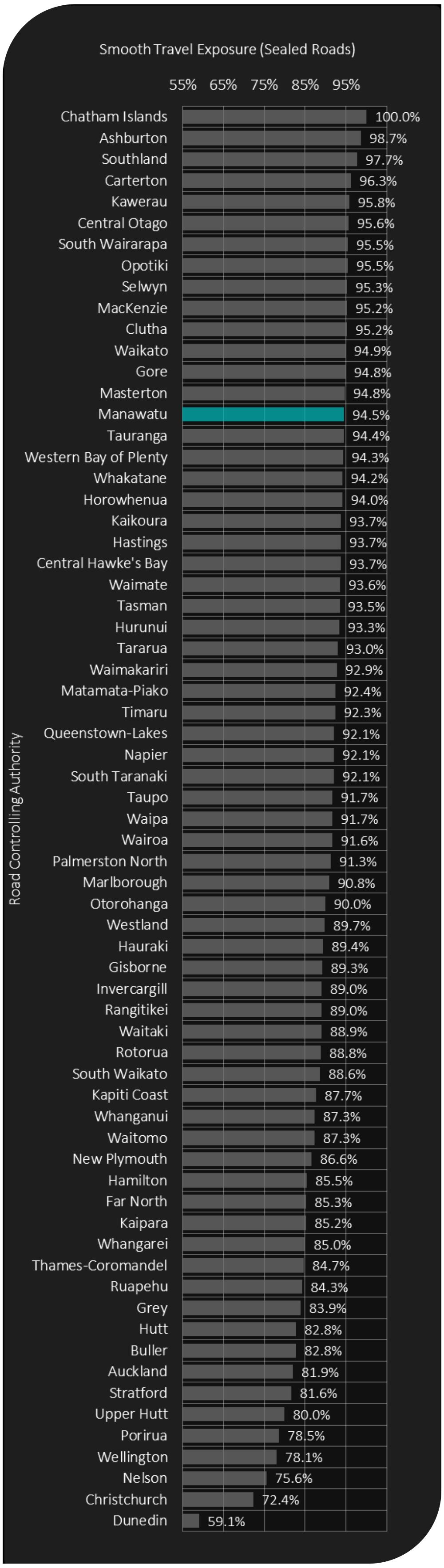
Due to inflationary pressures, less work can be delivered for the same amount of money; as a result, the risk that the road network will deteriorate also increases. If we do what we've always done, the likelihood of failure trends toward medium-high risk (significant impact, see right).

The consequence of this is a longer term deterioration of the network; this scenario is displayed below, showing each environment performing worse than currently (excepting structures, where these are longer lived assets and deteriorate more slowly in general).

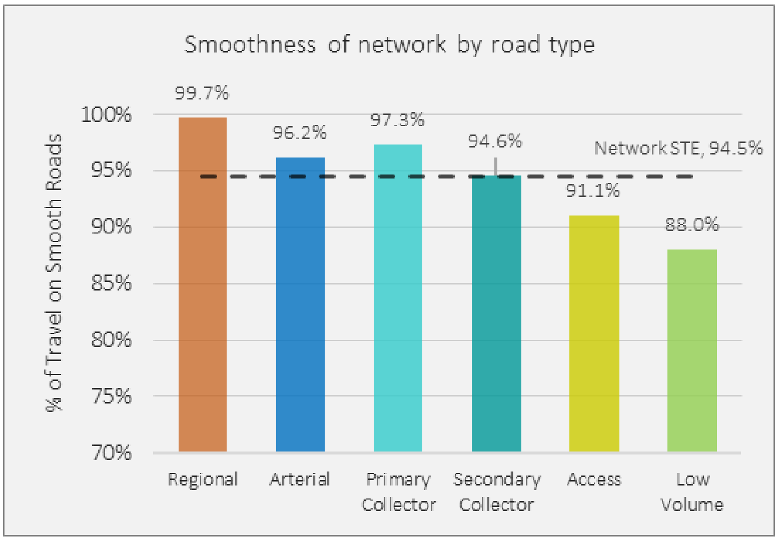


1.3.7 Current status

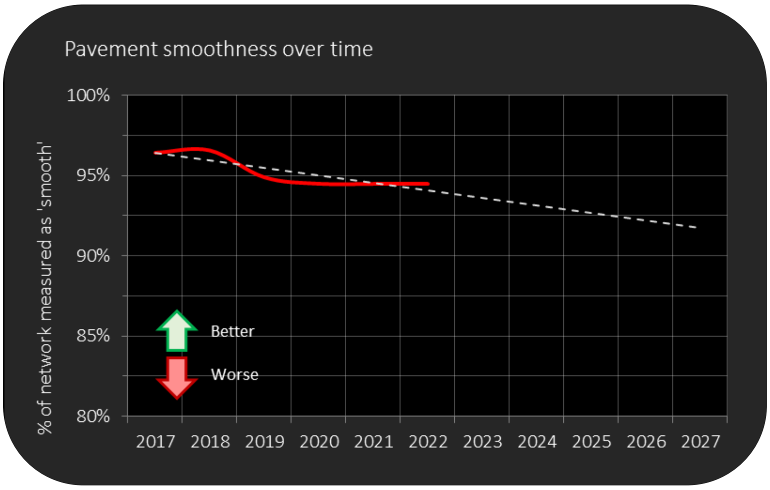
The road network currently performs at an acceptable level. The primary measure – how smooth the roads are – shows that MDC performs well in relation to New Zealand's other Road Controlling Authorities.



Smoothness of the sealed network also reduces as you step down the road classification hierarchy, aligning with the expectation of a lesser Level(s) of Service to roads carrying lower traffic volumes:



However, ride quality has been deteriorating gradually, as seen below:

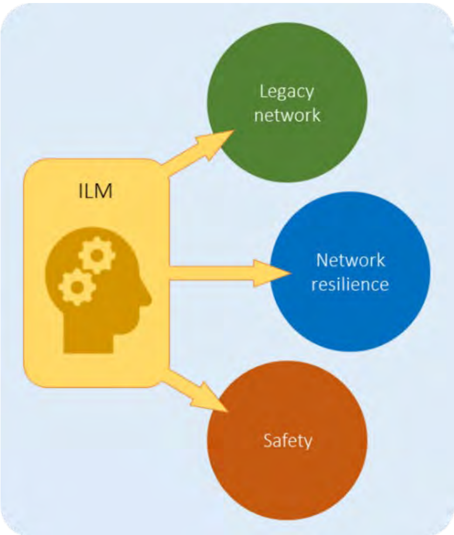


Key Finding

It is evident that the network is beginning to deteriorate; given the funding level to date, the quantum of pavement related maintenance and renewal is no longer adequate in maintaining performance.

1.4 Network issues

Using the investment logic mapping (ILM) framework - in combination with existing evidence - Council have identified the following key issues:

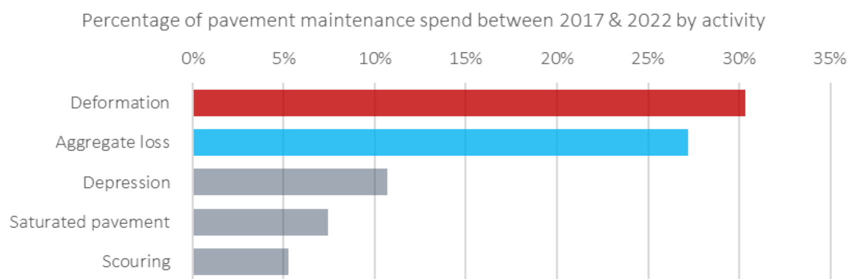


Deteriorating condition and changing demands on Access, Low Volume and Secondary Collector roads are resulting in decreased Levels of Service and increasing reactive interventions

The Manawatū District is susceptible to increasingly severe climatic events resulting in significant reactive maintenance expenditure, disruption to the network and increased road safety risks

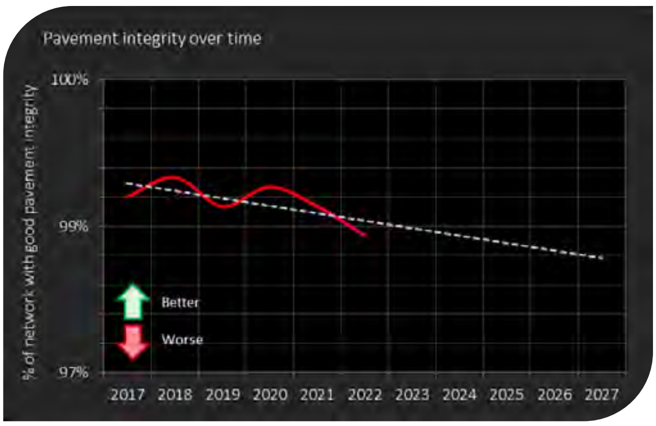
Given the level of Fatal and Serious crashes in the last 5 years, investment is required to achieve the 'Road 2 Zero' target of 'a 40% reduction on 2018 Fatal & Serious crashes'

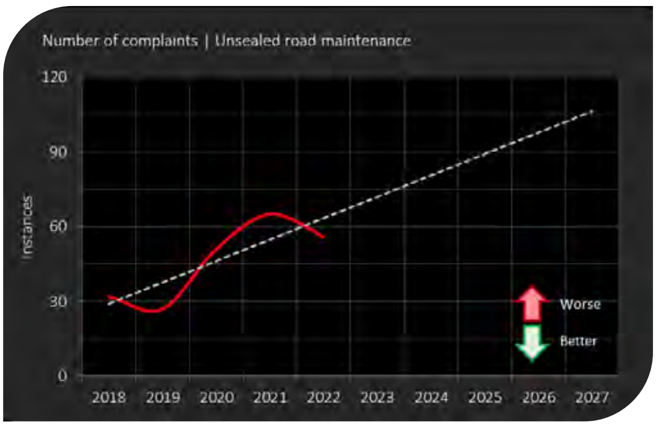
1.4.1 Issue 1 | Legacy network



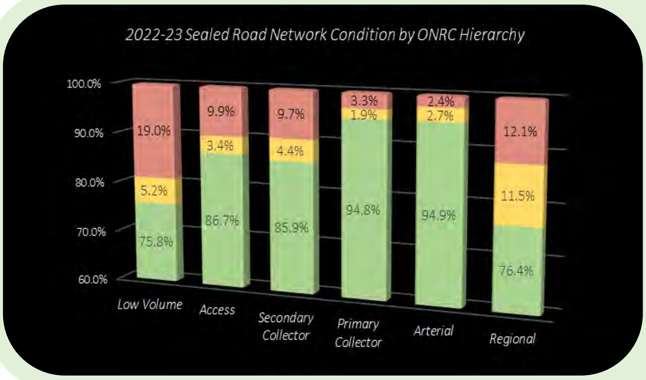
Maintenance costs show that road defects such as deformation of the road and gravel loss account for the majority of our spend over the past 5 years.

This is to be expected, given the recent forestry activity and general increase in traffic volumes over the same period. The level of spend allocated to addressing these defects has not been sufficient to entirely maintain pavement performance, when measuring pavement integrity of sealed roads and complaints / requests for service on unsealed roads:





Ongoing road maintenance is essential in order to preserve the road asset, protect user safety, and provide efficient and convenient travel along the route. If maintenance is neglected or improperly performed there will be a deterioration of the road and eventual failure from both climatic and vehicle use impacts.



Key Focus

With ongoing forestry harvesting, increasing population, and associated traffic volumes predicted for Manawatū, a focus on maintenance and renewal is required to combat pavement deterioration, particularly to Low Volume, Access and Secondary Collector level roads.

1.4.2 Issue 2 | Network resilience

During the last 5 years, landslip clearance has been the highest spend environmental management item for Council.

Recent storm and intense rainfall events across – and feeding into – the district have caused several rivers to breach their banks on a frequent basis. At the same time, copious quantities of forestry slash and riverbank trees have been washed down, impacting on several bridges. These impacts have ranged from significant debris build-up at piers to total loss of the asset, requiring substantial repair or reinstatement.

Churchill Rd (Pohangina River)

Complete loss

Londons Ford Rd (Oroua River)

Debris build-up

Coulter Line (Oroua River)

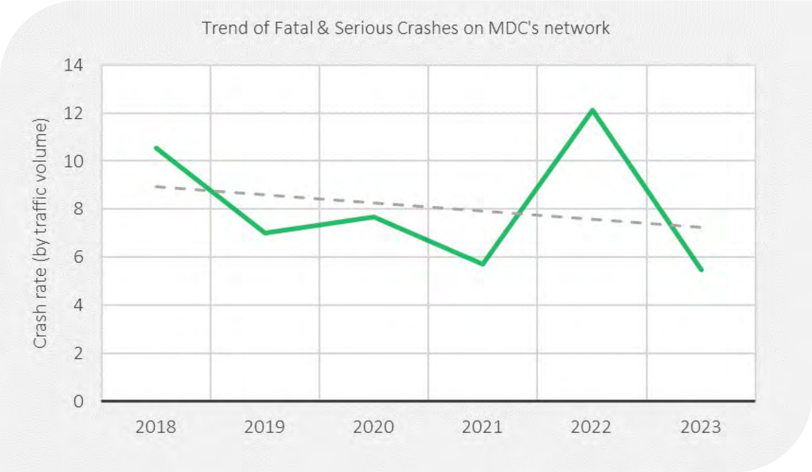
Overtopping damage

Key Focus

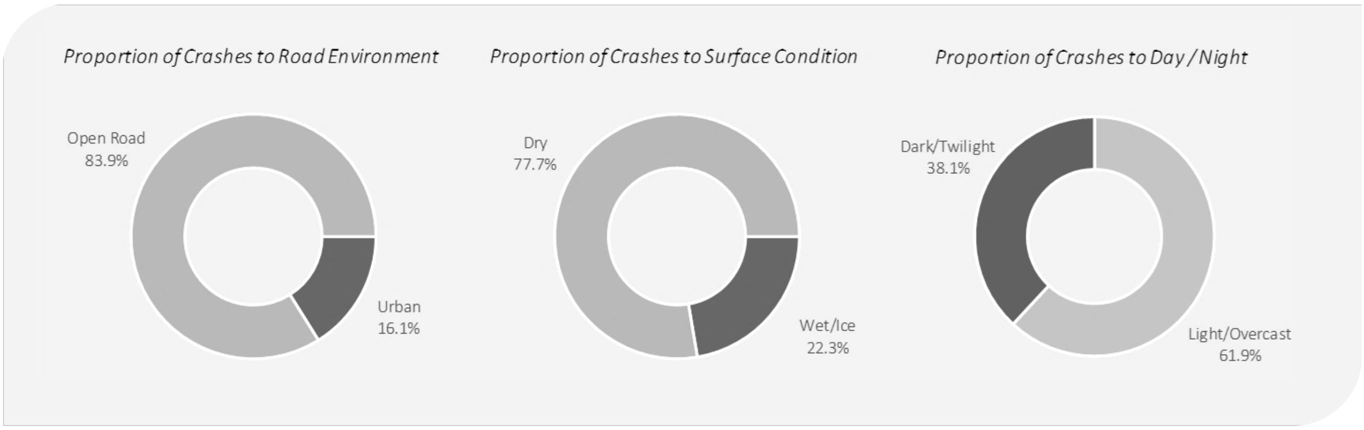
The number of landslips and compromised assets experienced on the network is high, with some vulnerable roads having no alternative route available whilst remediation is undertaken. This is creating significant time delays and access issues for MDC's residents, requiring further investment in maintenance and renewals activities to prevent and minimise the duration of road closures in future.

1.4.3 Issue 3 | Safety

Whilst implementation of Council's road safety programme has resulted in an, overall, downward trend in fatal and serious crashes on its network over the last 5 years, the incidence rate of crashes remains high. This reflects in significant social and economic cost to the district (and NZ as whole).



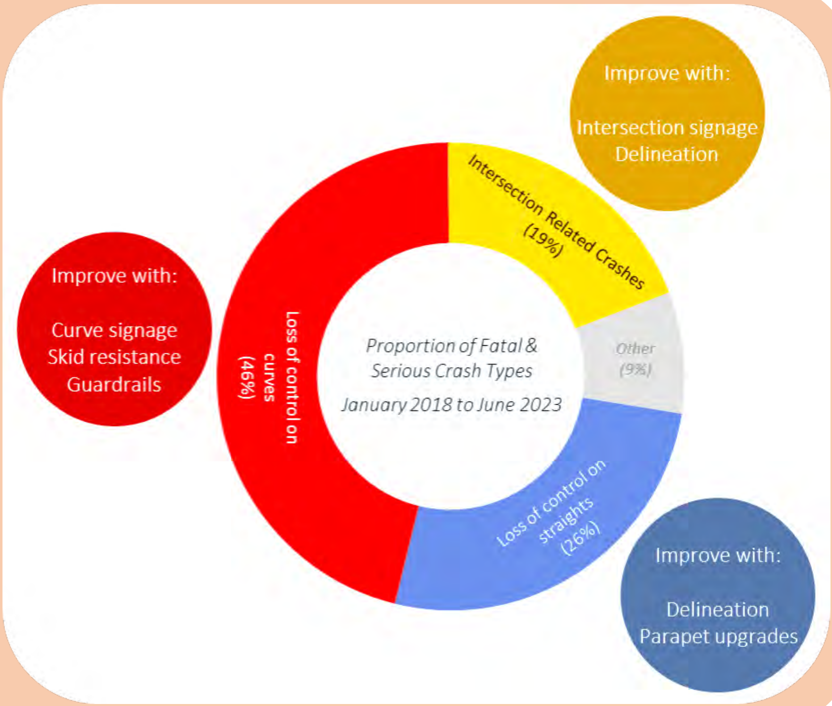
The majority of fatal and serious crashes occur on rural roads, with an appreciable number during low light & nighttime conditions, wet roads, and at rural intersections:



Key Focus

Continuing Council's programme of safety related activities will improve safety on the network, focussing on 3 key aspects (see right).

The programme will aid MDC in achieving Central Government's laudable goal of reducing fatal and serious injuries by 40% from 2018 levels.



1.4.4 Case for change

Without the appropriate funding, the problems in the Manawatū District will become worse over time, and therefore more difficult for Council to manage or resolve. This will have major impacts for the wider community and how it functions.

Furthermore, the impacts due to climate change have been exacerbated, making the network more vulnerable to closures and putting communities at risk of isolation and injury. Recent climate change events have also impacted the distribution of limited Council funds, with money originally allocated to maintenance, rehabilitation or reseals being used for emergency works. New Zealand Transport Agency's Emergency Fund has a lengthy turnaround period, forcing the Council to put planned work on hold, prioritising remedial work in order to reinstate access for residents and businesses alike.

Key Finding

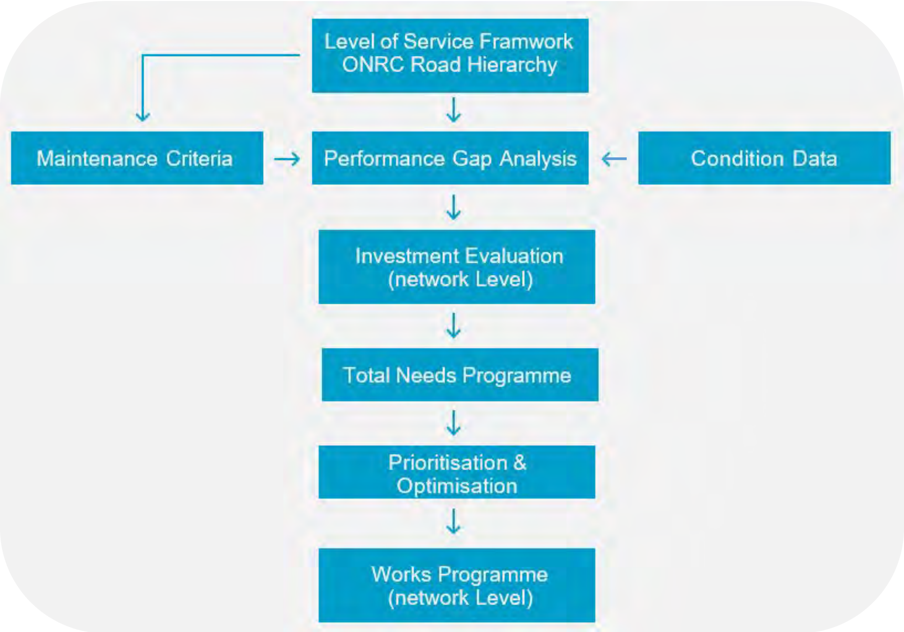
The Manawatū road network is critical in sustaining the growth and the economy of the district. Without adequate funding for maintenance, road assets will exponentially deteriorate, negatively impacting user access safety and experience within the community.

1.5 Programme

The Programme is set by the strategic case and takes into account limitations in budget allocation. The preferred programme attempts to adequately address the issues identified above.

1.5.1 Developing the programme

Through the 2024-27 AMP, Council aims to maximise the benefit derived from investment in maintaining, operating and improving the local road network as part of the transport system, and to grow the regional economy in a safe and sustainable manner.



In developing the 2024-27 AMP, Council ensures that the expenditure associated with the programme of work fits within its allocated budgets. To do this, Council has implemented a rigorous programme development process to extract the maximum value for money from our operations, maintenance, and improvement programmes.

1.5.2 Optimising the programme

A Multi-Criteria Analysis (MCA) has been undertaken to assist in preparing the programme. The chosen criteria consistently score 3 options across aspects that are important to MDC, identified as:

Resilience	Condition	Safety	Customer Satisfaction	Service Delivery	Financial Impacts

The MCA process was undertaken separately for each work category that constitutes the programme. These include:

Maintenance	Renewals	Road Improvements	Active Transport	Public Transport

The MCA is a qualitative analysis using specialist judgement and was undertaken in 2 stages:

Stage 1 assesses the 'as is' (baseline) Maintenance, Operations and Renewals (MOR) programme against existing network condition (essentially '*no change*' scenario, '*doing what we've always done*'). This assessment allows the value of the baseline investment and consequence to network condition to be determined. It also determines funds remaining for improvement works, for a given level of rate setting.

Stage 2 of the assessment assesses the impact of changing the investment level for each work category (and its consequential performance), accounting for the remaining funds that can redistributed across the programme for a given level of rate setting. The final programme is a result of this collaborative approach with the Elected Members and customers in determining where to focus our efforts.

1.6 Funding

The 2024-27 Programme had set an anticipated 6.0% per annum increase in funding requirements (above that set by Council for the previous - 2021-24 - funding block). This value accounted for:

- Predicted inflation figures produced by BERL as of October 2022
- Arresting the deterioration of the network's core condition
- Anticipated market rates associated with Road Maintenance activities and contracts, and
- A Financial Assistance Rate (FAR) via NZTA of 51%

Any funding remaining had been allocated to improvement projects, prioritised through a combination of economic benefit, social and well-being enhancement, submitted community requests, and Council's desired direction.

However, ***there have been significant constraints applied to the funding for such Road Improvements*** (encompassing safety, walking and cycling, and public transport), which has resulted in very limited funds via NZTA being made available to Council.

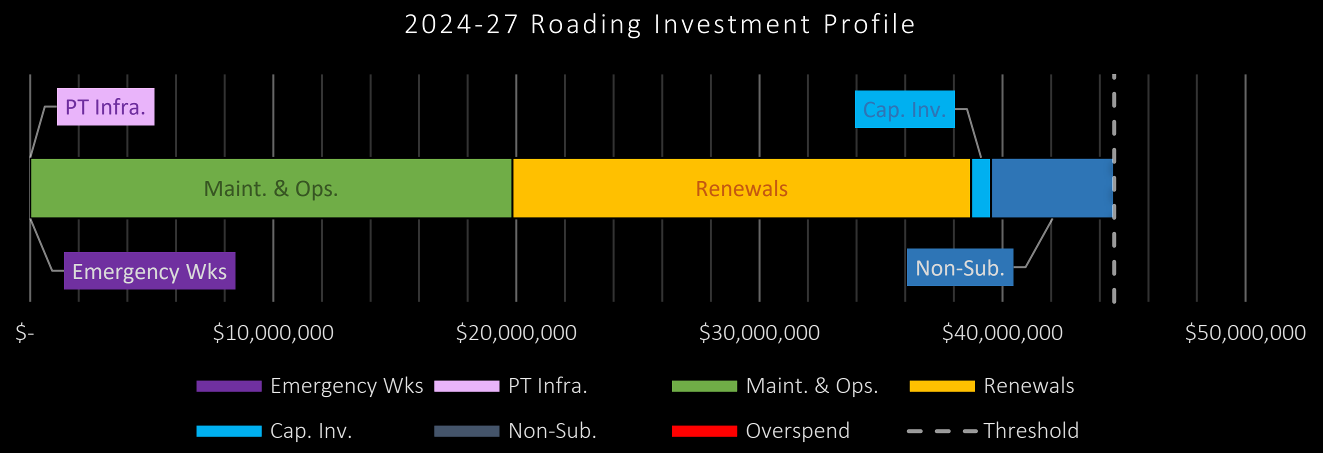
Based on this, MDC has identified a 3-Year programme which will do its best to address the immediate challenges faced by the transport network, and deliver a limited set of activities within its available means.

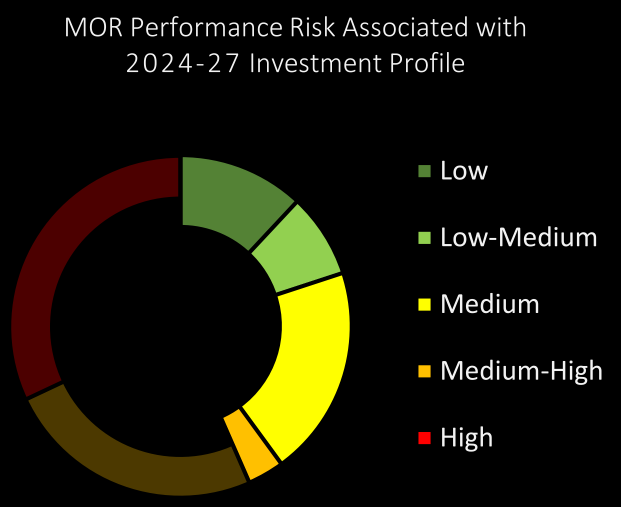
1.6.1 Investment programme summary

		3 Year Block 2024-27		
Subsidised Roading Budget		2024-25	2025-26	2026-27
Investment Management				
003	Investment Management Planning	11,771	44,990	80,238
004	Business Case Development	0	0	0
	Sub-total - Investment Management	11,771	44,990	80,238
Local Road Operations				
114	Structures Maintenance	298,319	309,953	319,872
121	Environmental Maintenance	1,309,693	1,360,771	1,404,315
122	Network Service Maintenance	556,550	578,255	596,759
123	Network Operations	16,594	17,241	17,793
131	Level Crossing Warning Devices	15,180	15,772	16,276
140	Minor Events	52,487	54,534	56,279
151	Network & Asset Management	1,430,478	1,486,267	1,533,827
215	Structures Component Replacements	904,386	691,775	805,419
222	Traffic Services Renewals	495,929	515,271	531,759
	Sub-total - Local Road Operations	5,079,615	5,029,839	5,282,300
Local Road Pothole Prevention				
111	Sealed Pavement Maintenance	1,238,319	1,286,614	1,327,785
112	Unsealed Pavement Maintenance	917,339	953,115	983,615
113	Routine Drainage Maintenance	516,572	536,718	553,893
211	Unsealed Roads Metalling	310,197	322,295	332,608
212	Sealed Roads Resurfacing	3,148,247	3,258,703	3,368,940
213	Drainage Renewals	549,126	570,542	588,800
214	Sealed Road Pavement Rehabilitation	772,000	833,000	806,500
	Sub-total - Local Road Pothole Prevention	7,451,802	7,760,987	7,962,141
Road Improvements				
216	Bridges & Structures Renewals	0	0	0
322	Replacement of Bridges and Structures	0	0	0
324	Road Improvements	0	0	0
325	Seal Extensions	0	0	0
341	Low Cost - Low Risk Programme	0	0	0
357	Resilience Improvements	252,240	334,536	232,548
	Sub-total - Road Improvements	252,240	334,536	232,548
Walking and Cycling				
124	Cycle Path Maintenance	919	954	985
125	Footpath Maintenance	24,876	25,846	26,673
225	Footpath Renewals	20,605	21,409	22,094
451	Walking Facilities	0	0	0
452	Cycling facilities	0	0	0
	Sub-total - Walking and Cycling	46,400	48,210	49,752
Public Transport				
514	Public transport facilities O & M	0	0	0
	Sub-total - Public Transport	0	0	0
Total Subsidised Roading Budget		12,841,828	13,218,562	13,606,980

		3 Year Block 2024-27		
Non-subsidised Roading Budget		2024-25	2025-26	2026-27
Maintenance and Operations				
	Sealed Pavement Maintenance	58,262	60,534	62,472
	Roading Response Reserve	157,650	163,798	169,040
	Traffic Services	47,295	49,140	50,712
	Feilding CBD Maintenance	61,623	64,027	66,075
	Sand Clearance | Beach Access Roads	16,807	17,462	18,021
	Network and Asset Management	25,765	26,770	27,627
	Sub-total Maintenance and Operations	367,402	381,731	393,946
Renewals				
	Roading Renewals	107,560	111,755	115,331
	Sub-total - Renewals	107,560	111,755	115,331
Road Improvements				
	New Roads	1,196,887	996,051	967,786
	Improvements (Other)	0	188,643	306,423
	Mitigation Sealing	0	0	0
	Sub-total - Road Improvements	1,196,887	1,184,694	1,274,209
Total Non-subsidised Roading Budget		1,671,850	1,678,181	1,783,487

	3 Year Block 2024-27		
Total Subsidised Roading Budget	12,841,828	13,218,562	13,606,980
Total Non-subsidised Roading Budget	1,671,850	1,678,181	1,783,487
TOTAL TRANSPORTATION ACTIVITY	14,513,678	14,896,743	15,390,467





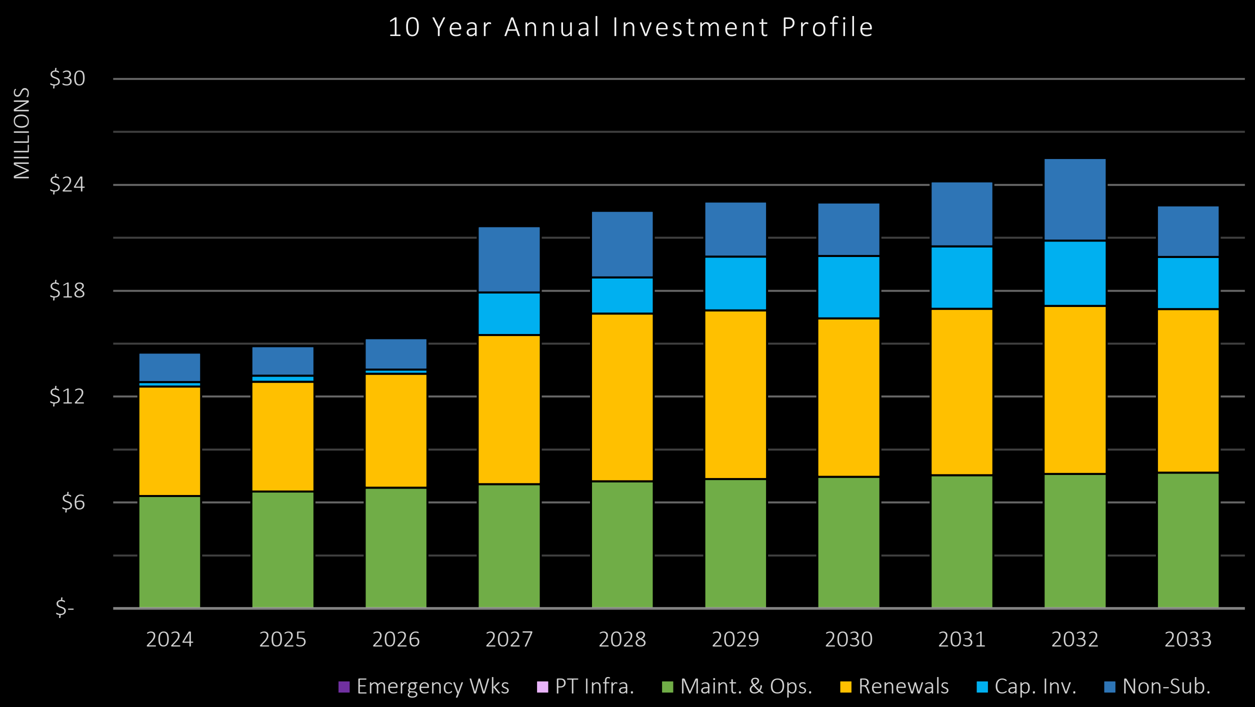
Programme aligned to minimise risk of failure (see left) in condition of:

- *Sealed Roads*
- *Unsealed Roads*

Targeting or compensating for:

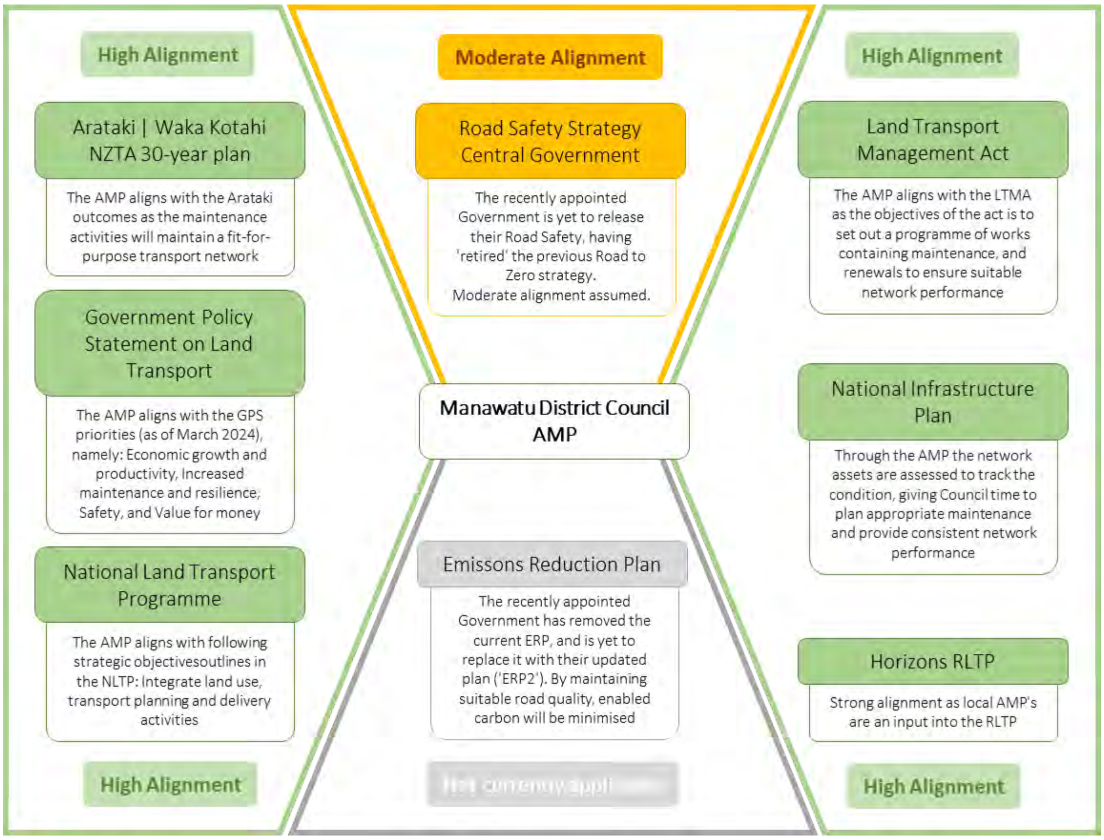
- *Adverse weather event disruption*
- *Maintaining network connectivity*
- *Inflationary pressures*

Confirmed 2024-27 funding has increased Council's risk of being unable to deliver expected levels of service to Medium-High



1.7 Strategic alignment

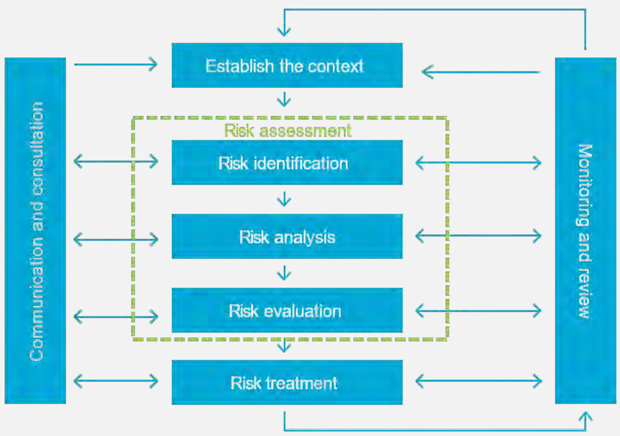
To verify funding is being allocated appropriately, investigations into the network condition and performance are undertaken to align items of the programme as best they can with the overarching strategic direction, set by Government and high-level transport authorities. The figure below shows MDC's proposed programme alignment with such policies:



Council's proposed programme and related activities is also aligned and integrated with the procurement programmes of other approved organisations and other entities. The 3-year programmes are routinely co-ordinated on a regional level with the neighbouring roading authorities of Rangitīkei, Horowhenua and Palmerston North.

1.8 Delivery and risk management

Council is confident that the described programme can be delivered. Council has a proven track record of sound delivery with previous investment in continuous programmes and related activities (particularly in terms of timing, alignment, and management of the funding allocation). Council has the capability and the capacity to deliver and manage this programme, particularly in terms of resourcing adequacy and the skillsets available. Council has identified its key risks for the type and complexity of the network, and has a sound mitigation strategy in place



PART A | STRATEGIC CASE

1.1 Introduction

Manawatū District Council (MDC) is committed to investing in transport infrastructure based on robust evidence to sustain the network in the long term; by targeting the right treatment, to the right place, at the right time, and for the right cost.

This Activity Management Plan (AMP) has been prepared with regard to transportation assets owned and operated by MDC on behalf of its community and ratepayers. This plan has been produced and reviewed as required by legislation set out in the Local Government Act (LGA) 2002. Under the Act, Council must deliver revised Plans to its community on a 3-yearly cycle.

This Plan acts as a road map for the future by providing the context behind how we maintain, operate, renew, and improve Manawatū's land transport network. Activity management involves the balancing of costs, opportunities, and risks against the desired performance of assets, to achieve the organisational objectives, desired outcomes and benefits for our customers and represent value for money. It is also important that we show how we will meet regulatory requirements and environmental protection.

Activity management also enables Council to examine the need for, and performance of, assets and asset systems at different levels. Additionally, it enables the application of analytical approaches towards managing an asset over the different stages of its lifecycle (which can start with the conception of the need for the asset, through to its disposal, and includes the managing of any potential post disposal liabilities).

The maintenance strategy and proposed capital projects included in this document have been developed to be consistent with, and contribute towards, achieving wider national and regional land transport priorities and objectives. These priorities and objectives are guided by the Government Policy Statement on Land Transport (GPS) and will aid the development of the Regional Land Transport Plan (RLTP). By ensuring alignment with these high-level strategic documents, the Council will not only realise its local strategic vision but will also play its role in achieving a sound regional and strategically integrated land transport network.

1.2 Purpose of this plan

In order to fulfil community outcomes, vision, goals and objectives, Council have adopted a systematic approach to the long-term management of its assets by preparing this Activity Management Plan.

The key objective of an AMP is to provide a desired level of service in the most cost-effective manner while demonstrating responsible stewardship for present and future customers.

Activity Management Plans are a key component of the strategic planning and management of Council, with links to the 10-Year Plan and service contracts.

The AMP underpins the Long-Term Plan (LTP) and consultative processes that have been put in place to engage the community. The AMP delivers a range of benefits to the community as well as to the provider of the services, the main ones being to:

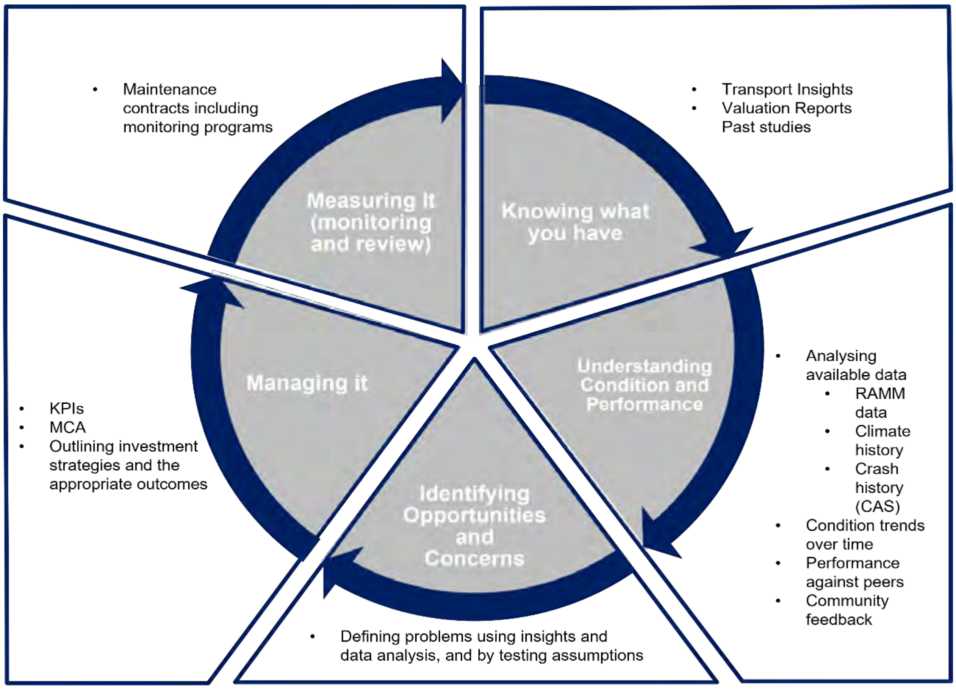


FIGURE 1: THE ACTIVITY MANAGEMENT PROCESS

- Maintain, replace, and develop assets over the long-term to meet required delivery standards and foreseeable future needs at minimal cost
- Continually improve activity management practices and service delivery to the customers
- Comply with statutory requirements

The primary purpose of this document is to determine the investment required for the network over the next funding period, identify key risks, determine interventions and cashflow, performance monitoring, and improvement priorities for the future.

1.3 Goals and objectives

Council has identified strategic goals to guide investment in land transport initiatives. These goals link the ‘strategic’ element with the ‘operational’ aspects. Council chose to update its priorities in 2020 to provide a clear direction of where the district wished to invest over the next 10 years. This also provides a clear picture of the district’s wishes to the New Zealand Transport Agency Waka Kotahi (NZTA) when it compiles the National Land Transport Programme (NLTP).

Council’s 6 priorities under the strategic framework for its current LTP are as follows:

- A place to belong and grow
- A future planned together
- An environment to be proud of
- Infrastructure fit for the future
- A prosperous, resilient economy
- Value for money and excellence in local government

This AMP covers all land-based transportation activities that Council pays for, either fully or with assistance from NZTA. It considers how Council assets can best be managed to deliver the required transportation activities to meet our community outcomes, the four well-beings, Transport Outcome Framework, the draft GPS strategic priorities, and the Transport Insights Pillars of Success. Table 1 below demonstrates how our transport activity helps to deliver these outcomes, as well as how these activities align with the RLTP's and Council's strategic goals.

TABLE 1: KEY SERVICES AND ALIGNMENT OF COUNCIL STRATEGIC GOALS TO REGIONAL AND NATIONAL OBJECTIVES

Community Outcomes [1]	*Key Services we Provide*[1]	*Well beings*[2]	*2024 GPS Strategic Priorities*[3]	*National Transport Outcomes*[4]	*Pillars of success*[2]
A place to belong & grow	Maintenance and renewal of: Sealed and unsealed roads Infrastructure Traffic services incl. signage, road marking, and other road furniture Safety Improvements	Cultural Social Economic	Economic growth and productivity Increased maintenance and resilience Safety Value for money	Better travel options	Communication
A future planned together	Maintenance and renewal of: Active mode Infrastructure Traffic services incl. signage, road marking, and other road furniture Safety Improvements	Economic Cultural	Increased maintenance and resilience Value for money Safety	Climate Change Better travel options	Systems
An environment to be proud of	Maintenance of the road reserve including: Mowing, weeding, sweeping, cleaning, dust mitigation measures	Economic Environmental	Increased maintenance and resilience Value for money	Climate Change	Evidence
Infrastructure fit for the future	Planning and management to ensure the transportation system is able to cope with future needs Development of the transportation and traffic networks	Economic Cultural	Economic growth and productivity Increased maintenance and resilience Safety Value for money	Improving freight connections Better travel options	Service Delivery
Value for money and excellence in local government	Periodic reassessment of problems and robust assessment of the Forward Work Programmes	Economic Social	Economic growth and productivity Increased maintenance and resilience Value for money	Improving freight connections Better travel options	Decision Making

[1] 10_Year_Plan_2021-2031.pdf (mdc.govt.nz)
[2] Transport insights | NZ Transport Agency (nzta.govt.nz)
[3] https://www.transport.govt.nz/area-of-interest/strategy-and-direction/government-policy-statement-on-land-transport-2024/
[4] Transport-outcomes-framework.pdf (cwp.govt.nz)

1.4 Activity management framework

Council's activity management process (embedded in this document) is divided into the 3 key parts, shown in Figure 2 below:

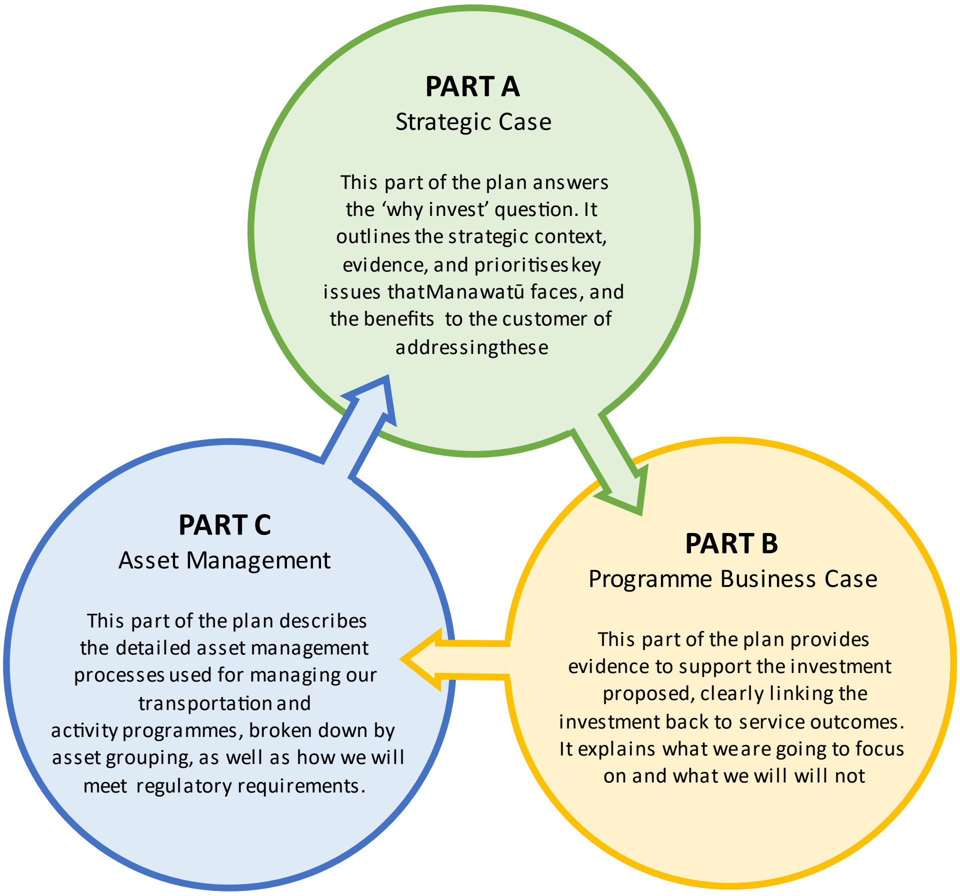


FIGURE 2: ACTIVITY MANAGEMENT PLAN FRAMEWORK

1.5 Key partners and stakeholders

Our key partners and stakeholders all have information and knowledge to help us make better decisions. In terms of setting the strategic context and direction for the AMP, our key partners and stakeholders are described below.

1.5.1 Ministry of Transport

The Ministry of Transport (MoT) is the Government's principal transport adviser, providing policy advice and support to Ministers.

By providing advice, MoT aim to:

- Improve the overall performance of the transport system
- Improve the performance of transport crown entities
- Achieve better value for money for the government from its investment in the transport system

The MoT helps the Government give effect to its policy by supporting the development of legislation, regulations, and rules. It also manages and accounts for funds invested in transport. The delivery of the transport functions through the NZTA.

1.5.2 New Zealand Transport Agency Waka Kotahi

The New Zealand Transport Agency Waka Kotahi (NZTA) is both a co-investor and manages the state highway operations. The Council, together with other approved Road Controlling Authorities (RCA's), has a very important ongoing relationship with NZTA, a funding partner to most land transport activities across New Zealand. NZTA ensures that equitable and nationally consistent levels of service are achieved over the network, and this is funded in a long-term sustainable manner. On average NZTA funds, through a subsidy, 53% of the cost of the Land Transport Programme for all RCA's in New Zealand.

1.5.3 Horizons Regional Council

Changes to the Land Transport Management Act (LTMA) 2003 have given a lead role to Regional Councils in regional transport planning. The Regional Land Transport Programme (RLTP) contains all land transport activities of the District Councils in our Region (Whanganui, Manawatū, Rangitīkei, Horowhenua, Ruapehu, and Tararua), Palmerston North City Council, NZTA, and Horizons itself. This sets out the transport activities of the region, for the purposes of obtaining funding from Central Government.

The programme is made up of prioritised activities and encompasses:

- Maintenance and operation of local roads and state highways
- Roading improvements (local roads and state highways)
- Public transport services and infrastructure
- Road safety activities
- Walking and cycling facilities
- Transport planning

The Regional Council also provides the natural resource management functions across the region. Horizons develops policies to guide the management of the Region's environmental resources - land, air, water, and coast. These policies set out the things that need to be done to achieve the environmental outcomes for the Region. Horizons use both regulatory and non-regulatory methods to meet the objectives in its policies, whereby regulatory management requires users of environmental resources to apply for resource consent and non-regulatory management involves providing advice, information, education, and funding assistance.

Horizons also monitor the effectiveness of these methods and carry out research into existing and emerging environmental issues.

1.5.4 Our neighbours

Rangitīkei District Council, Palmerston North City Council, and Horowhenua District Councils are our neighbouring RCA's. Agreements exist with these authorities, which outlines specific responsibilities in maintaining assets on various boundary roads. NZTA is responsible for the State Highways 1, 3, 54, and 56 that traverse through the Manawatū District. A memorandum of understanding exists with NZTA over each party's responsibilities and obligations.

1.6 Policy alignment

The LTMA 2003 states that Council has a statutory obligation to maintain a roading network within the district. Central Government provide a high level of direction and regulation into the transportation sector through Strategies, Plans, Policy Statements and Legislation. A large proportion of these documents are delivered through NZTA. Regionally there is a suite of Plans and Strategies, many of which link with the Horizons Land Transport Strategy. To help fulfil community outcomes, Council have adopted a systematic approach to the long-term management of its assets by preparing this Activity Management Plan.

This section describes the objectives to be achieved by the programme by stating the overarching strategic drivers and objectives of the proposed investment in the road maintenance programme. This AMP is guided by wider national and regional land transport priorities and objectives through the GPS, Arataki and the RLTP. Problems, issues and opportunities are identified and used to determine the forward works plan for MDC:

- Overarching Strategic Drivers [5] - Land Transport Management Act
- Government Policy Statement on Land Transport
- Arataki – New Zealand Transport Agency's 30 Year Plan (2023) [6]
- National Land Transport Programme [7]
- National Infrastructure Plan
- Horizons Regional Land Transport Plan 2021 - 2031 [8]
- The recently appointed Government's new Road Safety Strategy (*yet to be released*)
- Emissions Reduction Plan (*superseded - to be replaced with the Government's 'ERP2'*)

1.7 Strategic alignment

To verify funding is being allocated appropriately, investigations into the network condition and performance are undertaken to ensure that all items of programme development and implementation align with the strategic direction. This is also done by:

- Setting maintenance intervention criteria for the different road assets depending on their roading classification
- Using condition and level of service to measure performance
- Aligning the programme with the strategic direction and outcomes
- Optimising the intervention options when developing the total needs programme
- Selecting the types of treatments, materials and construction techniques when implementing the programme
- Ensuring that the activity management plan (AMP) follows the strategic direction

Table 2 details strategic alignment of the AMP against policies on the following 2 pages. An outline summary, illustrating the alignment outcomes can be found in Figure 3.

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[5] *Land Transport Management Act 2003 No 118 (as at 23 February 2022), Public Act Contents – New Zealand Legislation*
[6] *https://www.nzta.govt.nz/planning-and-investment/planning/arataki/about-arataki/*
[7] *About the NLTP | NZ Transport Agency (nzta.govt.nz)*
[8] *2021-31-Regional-Land-Transport-Plan.pdf (horizons.govt.nz)*

TABLE 2: STRATEGIC ALIGNMENT

Policy	Guidance and Alignment for this AMP	Alignment	
Overarching Strategic Drivers[9] - Land Transport Management Act	• The Land Transport Management Act 2003 states that Council has a statutory obligation to maintain a roading network within the district. Improve public confidence and demonstrate greater value from the land transport network. • Focus all levels of transport planning and delivery on the goals, strategy and expectations of the GPS and Council. • Work collaboratively with other Road Controlling Authorities (RCA's) to build capability, enable innovation, and develop customer-focused systems. Understand Council's contribution to the wider transport system. Collaborate with other RCA's to standardise systems. Understand the importance of Council's role in planning and delivering community outcomes. *Improving investment decision making* *Customer-focused investment* *Activity Management Excellence* *Evidence-based decision making* *Data acquisition, analysis, and use* *Service delivery excellence*	High	The AMP aligns with the Land Transport Management Act as the objective of the act is to set out a programme of works containing maintenance, rehabilitation, and replacement work, ensuring a suitably performing, well maintained road network that fosters continued confidence from the public.
Government Policy Statement on Land Transport (GPS)[10]	• The draft priorities for the 2024 GPS (updated by the recently appointed Government in March 2024) are: *Economic growth and productivity, Increased maintenance and resilience, Safety, and Value for money* • The GPS further states that '*this Government expects*' the following to be achieved: *Economic growth and increased productivity* • *reduced journey times and increased travel time reliability* • *improved access to markets, employment and areas that contribute to economic growth* • *more efficient supply chains for freight* *Increased maintenance and resilience* • *more kilometres of the road network resealed and rehabilitated each year* • *fewer potholes* • *a more resilient network* *Improved safety* • *reduction in deaths and serious injuries* *Value for money* • *better use of existing capacity* • *less expenditure on temporary traffic management*	High	The AMP aligns with the draft GPS priorities, namely: *Economic growth and productivity* *Increased maintenance and resilience* *Safety* *Value for money* The assessment of condition of the network allows Council to improve performance focusing on delivering safe, resilient infrastructure for all road users.
Arataki – NZTA's 30 Year Plan (2023)[11]	• Arataki provides direction at a National, Pan-regional and Regional level to set a cohesive, long-term and proactive programme for the transport sector. • The issues and desired outcomes for Manawatū-Whanganui have been summarised in NZTA's Arataki Regional Statement: *[The] focus … is on supporting urban growth, regional development initiatives and the COVID-19 recovery. We will work with partners to encourage increased use of public transport, walking and cycling, particularly in Palmerston North, manage the impacts of climate change, deliver safe and reliable inter-regional journeys and provide appropriate levels of service across all transport networks.'* • In line with this statement, it is expected that Council should engage in - and prioritise - activities that help deliver these benefits. The Step Changes identified by Arataki to help achieve the Government's desired outcomes are listed below, in order of priority for the Manawatū-Whanganui region: *Support regional development* *Significantly reduce harms* *Improve urban form* *Transform urban mobility* *Tackle climate change*	High	This project aligns with the expectations within Arataki as the maintenance activities and funding will include investment in maintaining a fit-for-purpose transport network, while improving safety and resilience.

Continued on next page…

[9] Land Transport Management Act 2003 No 118 (as at 23 February 2022), Public Act Contents – New Zealand Legislation
[10] https://www.transport.govt.nz/area-of-interest/strategy-and-direction/government-policy-statement-on-land-transport-2024/
[11] https://www.nzta.govt.nz/planning-and-investment/planning/arataki/about-arataki/

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Policy	*Guidance and Alignment for this AMP*	*Alignment*	
National Land Transport Programme (NLTP)	• Following the indicative strategic objectives in the GPS and Arataki, Council will be working to: *Apply a value for money approach to transport system investment* *Use technology and innovation to achieve improved performance* *Integrate land use, transport planning, and delivery activities* • From the Council's investment perspective, key strategic shifts are: *Reducing deaths and serious injuries* *An increased focus on environmental outcomes and greater parity across economic, social, and environmental outcomes* *A proactive modal shift in urban areas from roads to public transport and active modes* *A new emphasis on the role of transport infrastructure in 'urban place-making', to support liveable towns* *Local road improvements, safety improvements, and resilience* *Increased investment in optimising the efficiency of the system across modes* *Keeping maintenance and resilience treatments at an optimal level* • NZTA's Investment Prioritisation Method (IPM) is used to assess and prioritise funding for projects and programmes proposed for inclusion in the NLTP. Council will use this tool to guide investment proposals, once finalised.	High	The AMP through investigation of available data seeks to improve network performance where possible or maintain existing performance where appropriate. By doing this the AMP aligns with the following strategic objectives outlined in the NLTP: *Apply a value for money approach to transport system investment* From the Council's investment perspective, key strategic shifts are: *Reducing deaths and serious injuries* *Local road improvements, safety improvements, and resilience* *Keeping maintenance and resilience treatments at an optimal level*
National Infrastructure Plan	• The National Infrastructure Plan provides the framework for infrastructure development over the next 30 years and is focused on ensuring better use of existing infrastructure and allocating new investment to meet long-term needs. • The strategy indicates that: '*…the first plan will be reported to government by the end of 2021 and thereafter at least every 5 years…*' and that '*…the strategy will cover the ability of existing infrastructure to meet community expectations; current and future infrastructure needs and priorities; as well as any barriers which could impede the delivery of infrastructure or services arising from it…*'	High	Through the AMP the network assets are assessed to track the condition, giving the Council time to plan appropriate maintenance to provide consistent network performance.
Horizons Regional Land Transport Plan 2021 – 2031 (RLTP)	• The RLTP provides the strategic direction and policy framework for developing and investing in the region's land transport network and sets out how the region proposes to invest to achieve its objectives. It comprises of 3 key parts. • The project of works to physically deliver improving the regional land transport network is actioned by much of the programmed works contained within the local AMP's. Therefore, by achieving the specific projects and objectives in this AMP, this will contribute towards solving the problems and realising the benefits identified in the RLTP. • The Region's 30-year vision statement for the next RLTP is: *'A Region that connects central New Zealand and supports safe, accessible and sustainable transport options*'. • The following 5 objectives have been developed and are in the process of being endorsed by the Regional Transport Committee (RTC) to deliver on the vision statement above: *Travel choice* *Connectivity and efficiency* *Safety* *Environment* *Land use integration*	High	Strong alignment as local AMP's are an input into the RLTP
Government Road Safety Strategy	• The recently appointed Government is yet to release their Road Safety Strategy, having 'retired' the previous 2020 - 2030 Road to Zero strategy developed by the previous Government.	Moderate	Moderate alignment with improving safety around the network assumed
Emissions Reduction Plan	• The recently appointed Government has removed the current ERP, and is yet to replace it with their updated plan ('ERP2'). *A commitment to net-zero emissions by 2050 is still referenced in the updated GPS (as of March 2024)* *By maintaining suitable road quality, enabled carbon will be minimised*	Not Applicable at present	The AMP will not directly contribute to a reduction in emissions. However, by maintaining a suitable road quality and applying minimal new asset investment as a result of funding constraints, enabled carbon can be minimised.

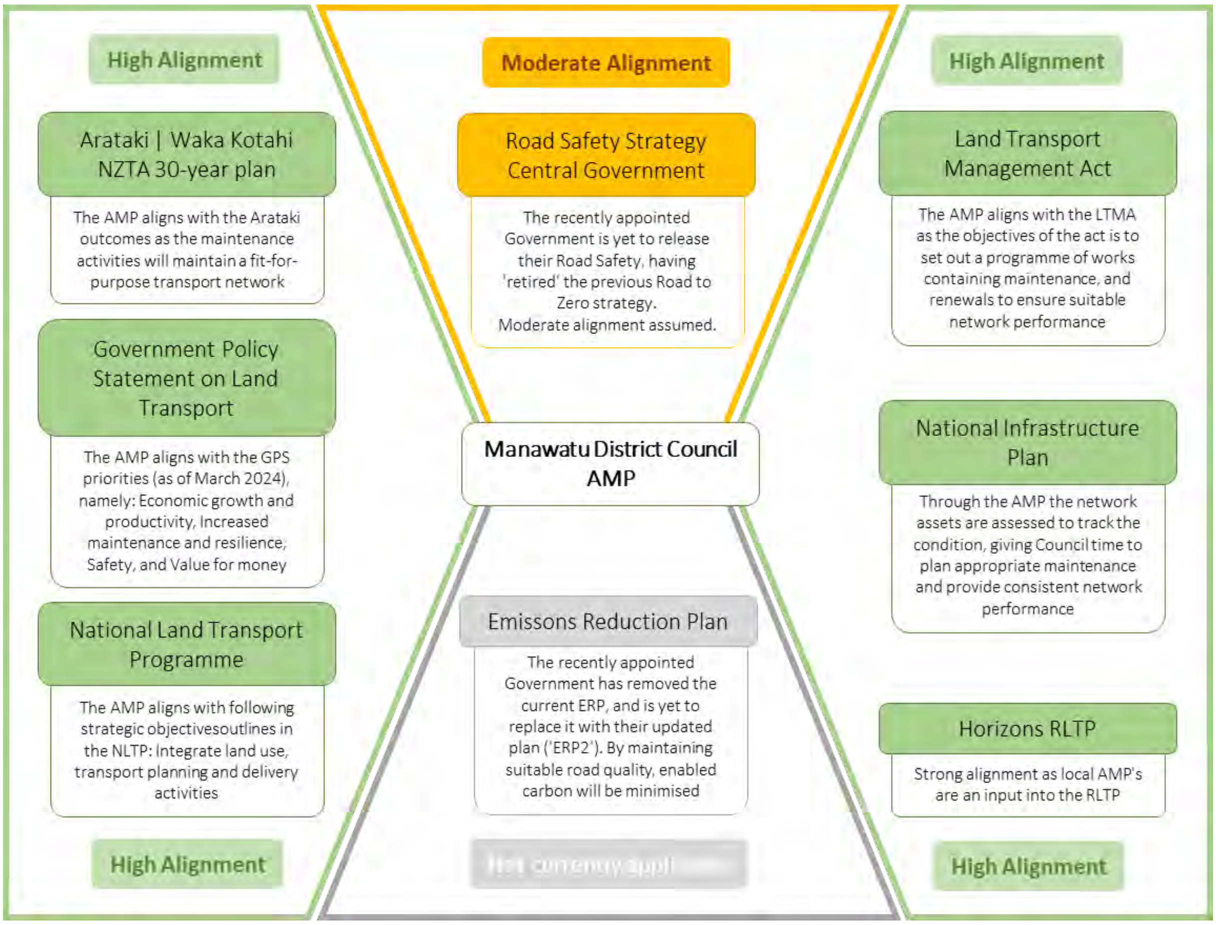


FIGURE 3: STRATEGIC ALIGNMENT

1.8 Relationship with other documents

This AMP is one of a number of key Council strategic documents that detail Council's activities with respect to how Council intends to deliver on the requirements of the LGA. It provides detailed supporting information for the Council's Long-Term Plan.

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

- The Land Transport Management Act 2003
- The Land Transport Management Amendment Act 2013
- The Local Government Act 1974, and Local Government Act 2002
- The Local Government Act 2002 Amendment Act 2015
- The Health and Safety at Work Act 2015
- The Government Policy Statement on Land Transport
- Horizons Regional Land Transport Plan
- The recently appointed Government's new Road Safety Strategy (*yet to be released*)
- Other Council Transportation strategies, policies and bylaws

1.9 Other references

The following documents are periodically published / updated in reference to updated Government strategic direction, priorities and objectives, and consequently influence management of transportation activity:

- NZTA's Statement of Intent 2021-2026
- NZTA's Statement of Performance Expectations 2022-2023
- NZTA's Rules, Policies and Guidelines (including published manuals)
- NZTA's Transport Insights and One Network Road Classification (ONRC) Guidelines[12]
- International Infrastructure Management Manual (IIMM)
- Ministry of Transport: New Zealand Rail Plan

1.10 The importance of transport for Manawatū

Council is committed to working for, with, and on behalf of the Manawatū community and the individual communities that make up the district to ensure that the district offers a high quality of life for all residents. To help achieve this, Council aims to promote economic, cultural, social, and environmental wellbeing in the present and for the future.

Table 3 below outlines how the Manawatū's transport network specifically contributes to the community wellbeing and outcomes, as set out by Council's 10 Year Plan[13]

TABLE 3: COMMUNITY WELLBEING AND COUNCIL PRIORITIES

Community Wellbeing	*Council priorities applying to the road network*	*Land Transport's Contribution*
Economic	A prosperous, resilient economy *We aim to make the Manawatū District a great place to live, to visit and to do business.* Value for money and excellence in local government *We take pride in serving our communities. We focus on doing the best for the district.*	Enabling the safe and efficient transport of goods and services throughout the district and connecting the Manawatū with the wider New Zealand economy Employing Better Business Case principals to ensure robust and targeted investment decisions
Cultural	Infrastructure fit for future *We ensure the Manawatū District has infrastructure (water, roads, etc.) that meets the needs of the community now and into the future*	Preparing for the changing needs of our communities and being resilient to evolving environmental conditions
Social	A place to belong and grow *We provide leisure and sports facilities and support community activities to encourage social and cultural well-being for everyone*	Ensuring that our roads and footpaths are safe to use, while encouraging the community to drive, walk, or cycle for business or pleasure
Environmental	An environment to be proud of *We protect and care for the Manawatū District's natural and physical resources.*	Protecting and enhancing the natural, cultural and built environment.

[12] *Whilst Council continues to use ONRC for a number of measures at present, we are also transitioning to the One Network Framework (ONF), with a view to fully embedding the ONF to measure performance, manage differential Levels of Service and subsequent programming.*

[13] *10 Year Plan 2021 – 2031, Manawatū District Council, 2021*

2.0 Network management

2.1 Current state

Council acknowledges that the current One Network Road Classification (ONRC) framework is being substantially enhanced through implementation of its successor, the One Network Framework (ONF). Council has previously embedded ONRC performance measures in its assessment, reporting and setting Level(s) of Service accordingly.

Whilst Council's transportation network has since been successfully redefined under ONF, a number of performance measures continue to be reported under ONRC classifications. In addition, the Differential Level of Service approach, multi-modal network layers and future state planning approaches integral to the ONF are still in development.

Council will therefore continue to use ONRC to manage and assess network performance during this AMP period. At the same time Council will undertake 'parallel' assessments using ONF measures as they are cemented, gaining comprehensive insight into the impacts and opportunities made possible by encapsulating the ONF in relation to the ONRC. As a result, Council believes this methodology will place it in good stead to fully embed ONF in future activity management plans.

2.2 Future state

The ONF is a road classification tool which uses place and movement functions to categories roads on the network, with a stronger emphasis on place than previous frameworks have given. It classifies the network into:

- rural or urban (based on land use, rather than road speed)
- assigns a place function (based on activity and physical form), and
- assigns a movement function (based on traffic volume)

by section (shown in Figure 4 on the following page). As such, a length of road can have multiple classifications based on its place and movement function. This allows for targeted design, better planning, and delivery of a modern transport system that meets the increasing needs of people, businesses, communities, and our climate.

It is anticipated the ONF will form the basis of the next AMP, as well as its performance measurement system (DLoS, the successor to the CLoS system). It is important to reiterate that the DLoS performance measures are still under development and will be incorporated into the next funding period.

To help translate the old system to the new, NZTA have released the graphics below (Figure 4 and Figure 5) as high-level guidance:

FIGURE 4: STREET CATEGORIES (NZTA'S ONE NETWORK FRAMEWORK)

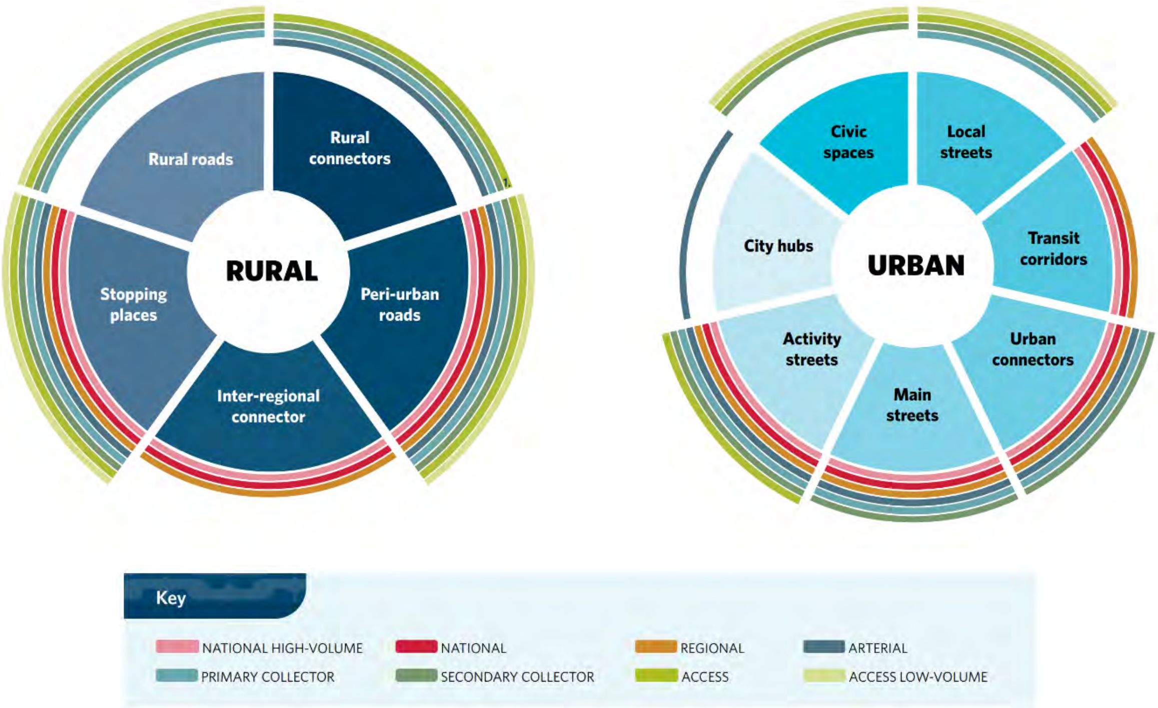


FIGURE 5: ONRC TO ONF: TRANSLATION OF ONRC TO ONF

2.3 Levels of service

The ONRC classification and available tools (i.e., Transport Insights) have made it easier for MDC to compare the state of roads to the national and regional road networks, as well as performance compared against peer groups, to understand performance, and value of current investment areas. This comparison aids in ensuring MDC and their ratepayers get the right level of investment in the road infrastructure where it is needed. The ONRC currently divides New Zealand's roads into 6 classifications (with additional sub-categories of Low volume and High volume at the extreme ends), shown in Figure 6 below.

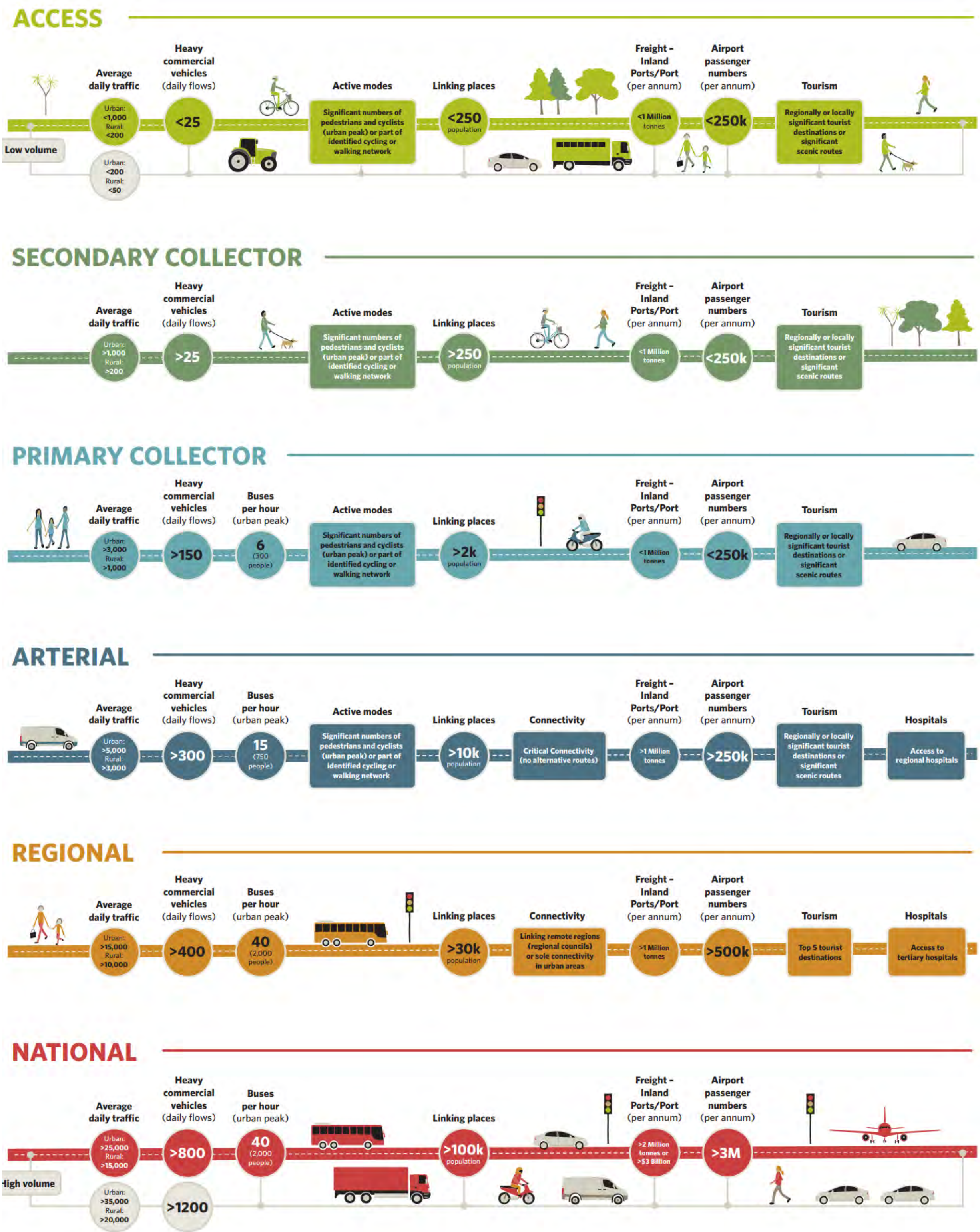


FIGURE 6: ONE NETWORK ROAD CLASSIFICATION THRESHOLDS

Transport Insights has taken the view that uniformly high operating conditions across all roads in the network are too costly to achieve and would not present an economic return on investment. On the other hand, it is impossible to manage an infinite number of standards and performance levels across the network. For this reason, and for reasons of equity and transparency, all roads meeting a specific range of functional criteria should achieve a uniform Customer Level of Service (CLoS)[14]. The overarching CLoS Performance Measures for ONRC are shown in Figure 7 below:

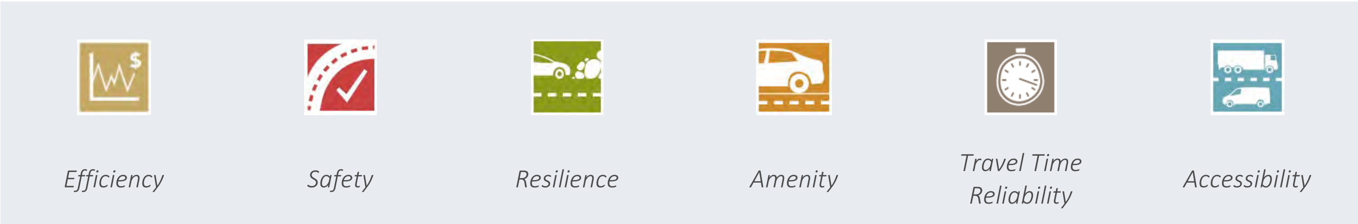


FIGURE 7: ONRC CLOS PERFORMANCE MEASURES

The current ONRC CLoS hierarchy has been developed by Transport Insights to define what class of asset is required. In the case of MDC, the CLoS measures have been used to determine unique performance measures for the Councils assets (discussed in more detail in Part B | section 1.4).

2.4 Customer research and expectations

In previous years the community outcomes were shaped by the community. However, amendments to the LGA in 2010 changed the definition of community outcomes, from "outcomes belonging to and achieved by the community", to "outcomes that a local authority aims to achieve". This is a significant change in emphasis from a community wish-list to a set of outcomes owned - and actively worked towards - by Council. Council believes it is also helpful for the public to understand what Council does and why, and for other stakeholders, including the private sector who both benefit from - and contribute to - Council activity.

Outcomes and Levels of Service are developed to reflect the expectations of the community and regulators. Targets are established which indicate the standard that should be met. Outcomes are relevant across the transportation activity while Levels of Service statements are more specific.

2.4.1 Resident survey

MDC commissions an annual resident survey to help understand how the community views and experiences the district, as well as measures the performance of the Council. The methodology involves a postal and online survey. The latest survey obtained a sample size of 596 respondents (greater than the previous survey, which garnered 455).

To inform the Activity Management Plan, this section focuses on feedback related to transport assets. '*Overall roads, footpaths and cycleways'* satisfaction is seen to be relatively stable between surveys taken in 2020, 2021, and 2022, fluctuating between 76% and 79%.

Satisfaction for '*adequacy of cycleways on our roads*' rose by 10% on the previous year, from 49% to 59% (slightly exceeding the level of satisfaction found in 2020). At the same time, satisfaction with '*safety of the roads*' has decreased by 5%.

[14] *Council is committed to transitioning from the ONRC to ONF during the next funding period*

It is worth noting that many of the scales observed no significant change between 2020 and 2022. The survey also found that residents of Feilding were generally more satisfied with '*roads, footpaths and cycleways'* than other residents throughout the district and that the 3 most common reasons for dissatisfaction related to footpaths, road maintenance and road layouts.

When registering a dissatisfied score (of 5 or less), respondents were also asked to provide a reason. Of the 239 participants who responded to this follow up question, the most common reasons stated for dissatisfaction were as follows:

- Footpaths are dangerous footpaths / uneven / tree and shrub maintenance needed / no footpaths (32%)
- Bad road maintenance / cheaply done / gravel roads (32%)
- Road layouts / roads not wide enough / road verges not maintained (31%)

The survey also looked at the impact of respondents' foci, highlighting that '*walkways*, *road safety* and *road condition'* should be targeted to improve Council reputation, as summarised in Figure 8 below:

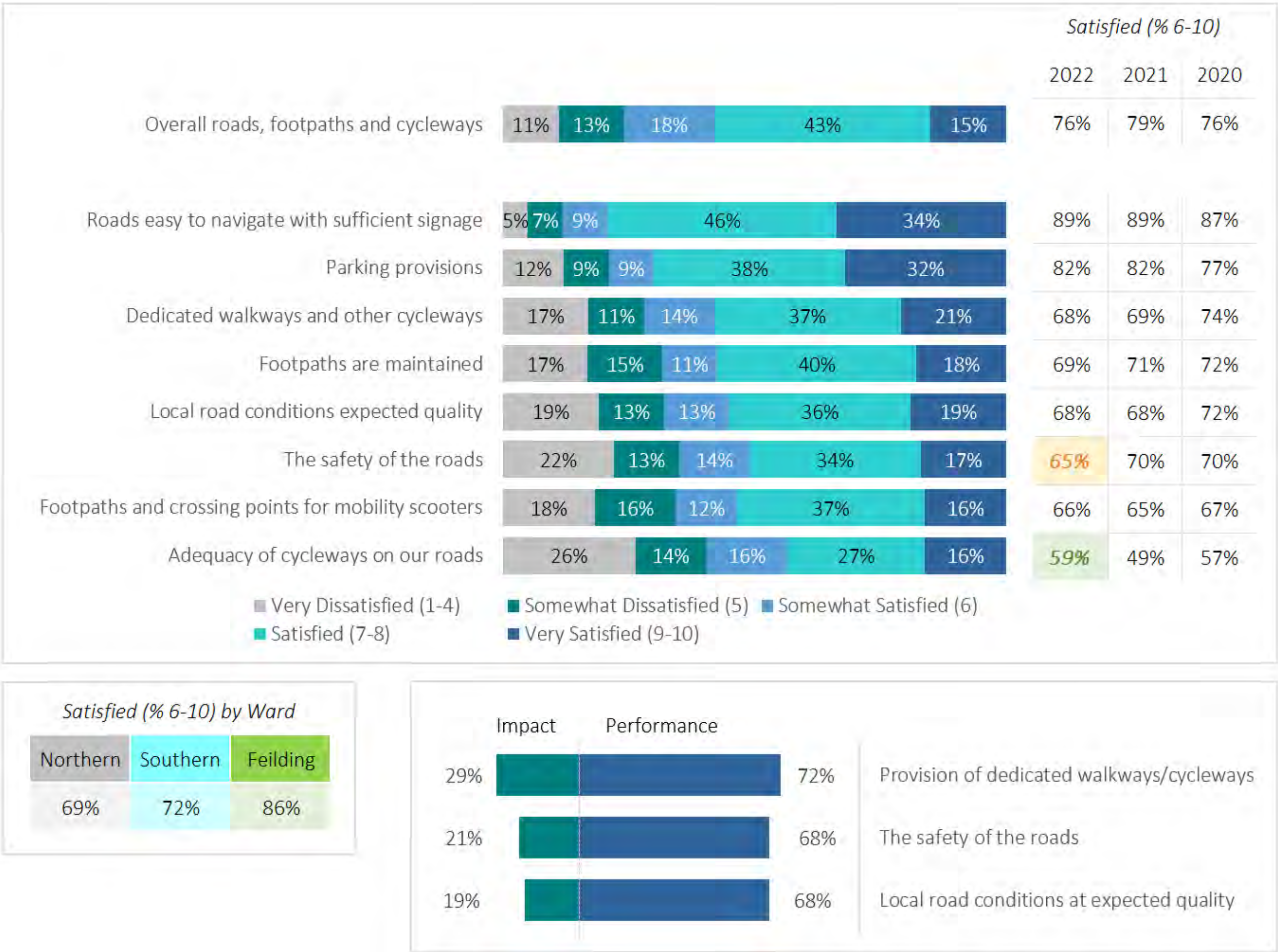


FIGURE 8: EXTRACT FROM 2022 MDC RESIDENT SURVEY RESULTS FOR TRANSPORTATION

2.5 Service gap identification tools

Council has access to a wide range of data that can be used to provide a baseline assessment of existing - or possible future - problems, and subsequently assist mitigation through policy setting. Resources are shown below (some of which have already been touched upon):

- Transport Insights (formerly known as the Performance Measures Reporting Tool)
- NZTA Monetised and Non-monetised Benefit and Cost Manuals (formerly the Economic Evaluation Manual)
- NZTA Crash Analysis System (CAS)
- NZTA ‘MegaMaps’ Geographical Information System
- NZTA ‘Speed and Infrastructure Programme’ (SIP) (formerly the Pipeline Development Tool)
- NZTA ‘Communities at Risk’ register
- Ministry of Transport Freight Demands Study
- Ministry of Transport Household Travel Survey
- Census / NZ demographic / NZ business surveys
- Council’s Infrastructure Strategy
- Council’s growth and development strategies
- Council’s walking & cycling strategy 2020
- Council’s resident satisfaction surveys
- Road Assessment and Maintenance Management (RAMM)
- Road Structures Life Cycle Management Plan 2023

RAMM software is used by Council to manage road inventory assets and condition for the Network. RAMM is a database that logs maintenance activities by asset type, location, maintenance undertaken and cost. The database is used by Council to store condition and expenditure information on the network; the analysis of this - together with other studies - is used to develop Council’s Forward Work Plans.

RAMM has connectivity with other proprietary information software (e.g., LocalMaps and Ozone) that Council has at its disposal, allowing information to be easily transferred and interrogated. GIS enables identification of an asset from the office or in the field, as well as facilitating the scheduling, reporting and co-ordination of maintenance activities.

Data from RAMM is also extracted to further analyse the large volume of information required for a variety of asset management functions.

3.0 Network composition

3.1 Overview

Transport assets are an important part of any district and a key component to enable the daily flow of people and commerce across the region. Understanding these assets is vital to determining current and future performance. MDC covers a sizeable land mass, as shown in Figure 9 below, with a transport network comprising of a broad range of assets that support economic activity within the district, the wider region and the Country.

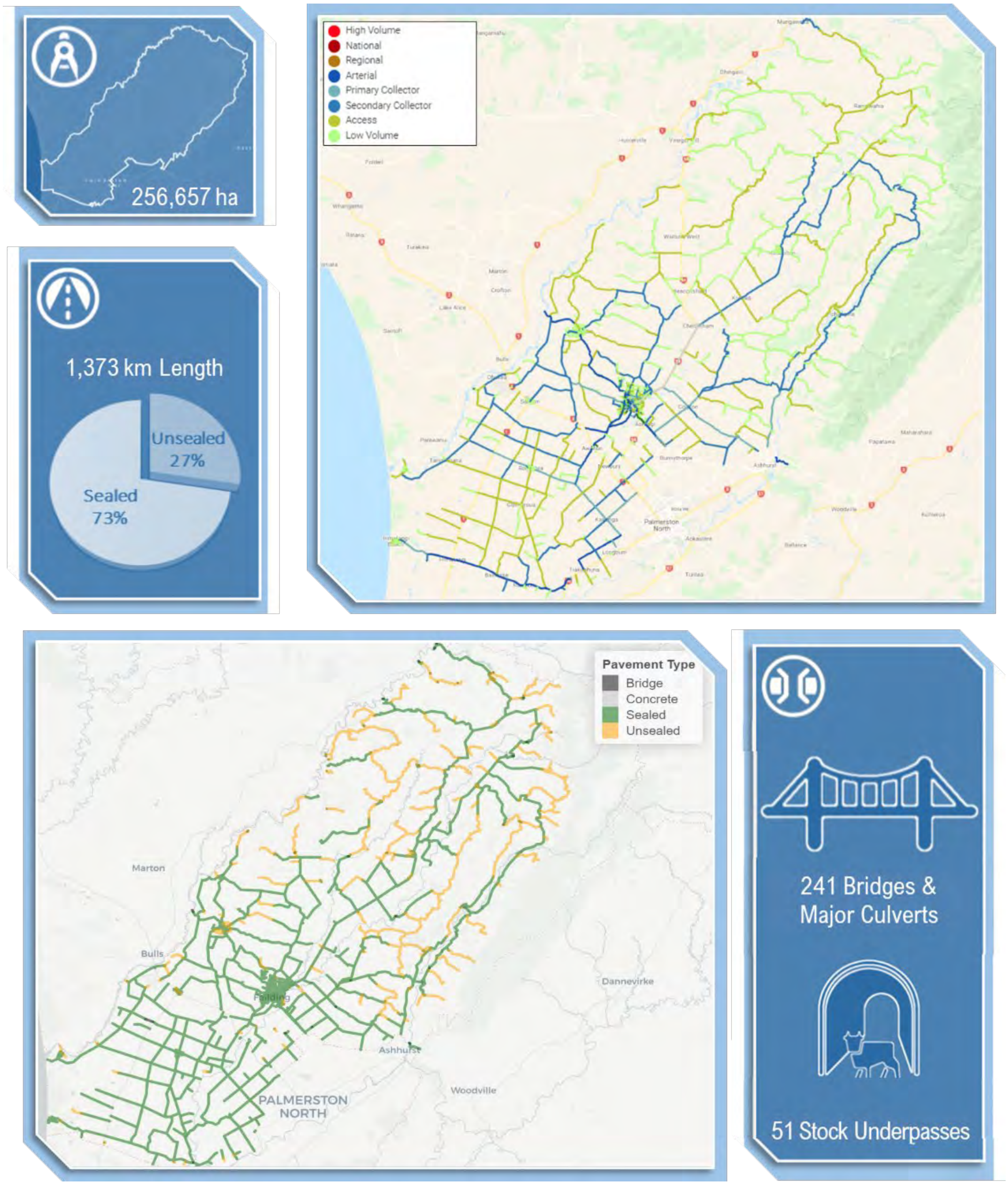


FIGURE 9: DISTRICT NETWORK COMPOSITION

The network comprises various assets ranging from bridges and pavements to signage and streetlights. Each of these asset groups has its own lifecycles and are managed through application of the systematic and cyclical processes, detailed in Part C of this AMP.

The MDC road network is summarised in Table 4 below:

TABLE 4: ONRC NETWORK CLASSIFICATION AND CHARACTERISTICS

ONRC	*Total Length (Km)*	*Network %*	*Urban (Km)*	*Rural (Km)*	*Sealed (Km)*	*Unsealed (Km)*	*Lane (Km)*	*Urban Journeys (M VKT)*	*Rural Journeys (M VKT)*
Regional	3	<1%	-	3	3	-	12	-	8
Arterial	63	5%	10	53	63	-	139	16	65
Primary Collector	71	5%	11	60	71	-	177	12	40
Secondary Collector	311	23%	23	288	311	-	602	10	50
Access	416	30%	29	387	387	29	614	4	19
Low Volume	509	37%	61	448	168	341	819	2	5
Total Network	*1,373*	*100%*	*134*	*1,239*	*1,003*	*370*	*2,362*	*44*	*188*

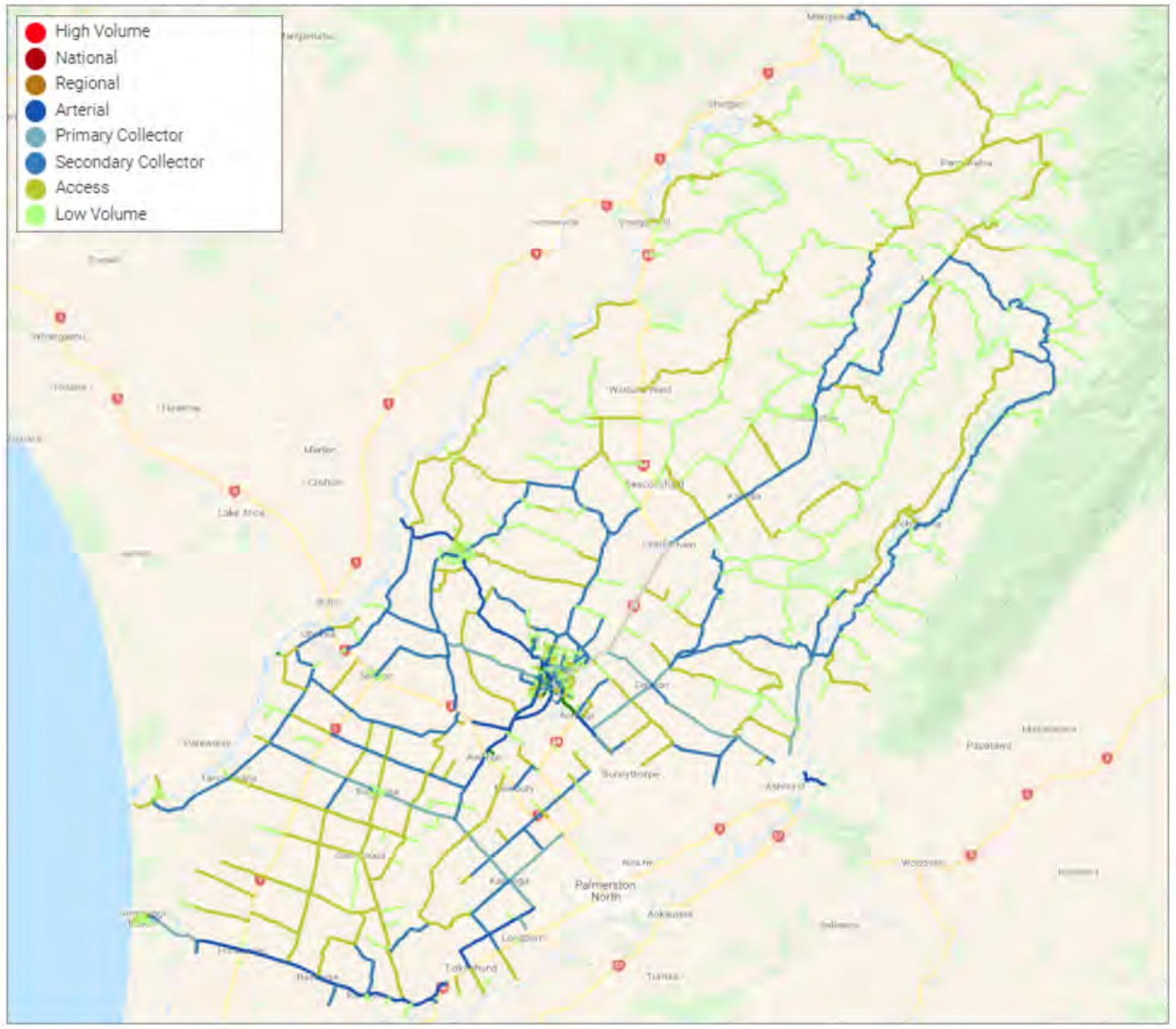
In line with the classifications, the table shows that 90.2% of the network is rural in nature, with the remaining 9.8% identified as urban, placing Manawatū in the '*Rural Districts*' peer group within New Zealand.

Furthermore, the following pages showcase Council's internally created dashboards, summarising network status under both ONRC and (the forthcoming) ONF hierarchies.

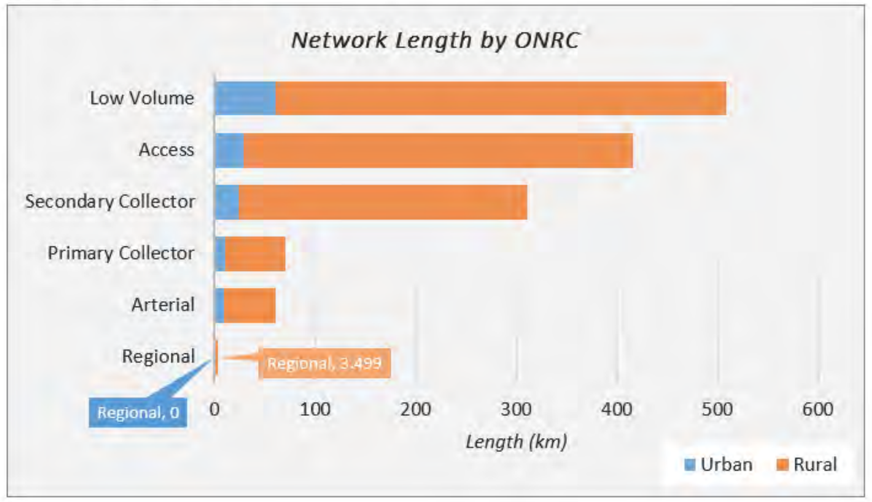
These dashboards not only identify network composition (as seen above), but provide additional information regarding:

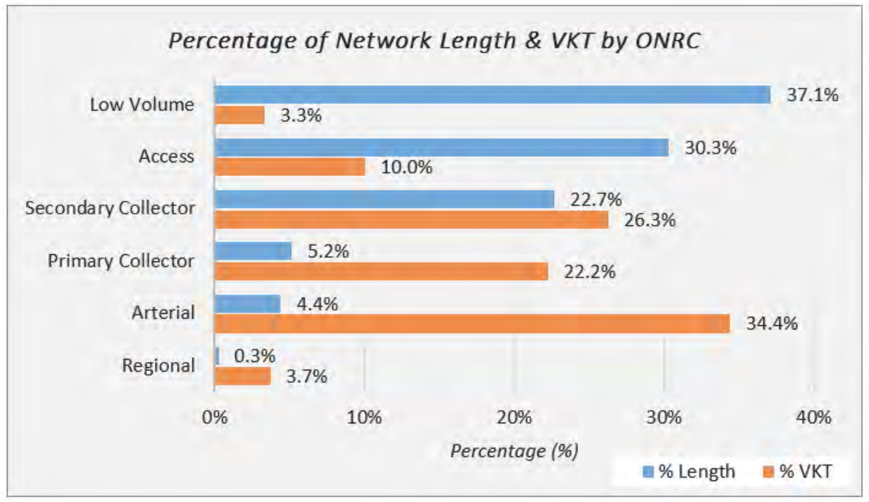
- Asset distribution
- Traffic usage
- Safety
- Smooth travel exposure, and
- Anticipated mean surface life

One Network Road Classification Map

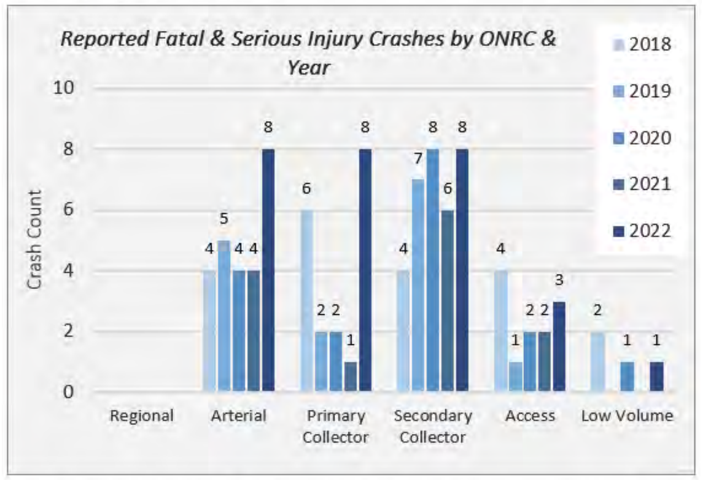


Network Level Overview

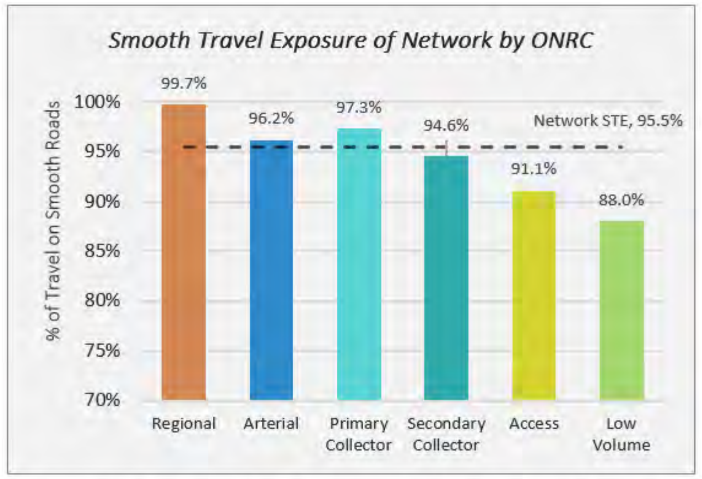




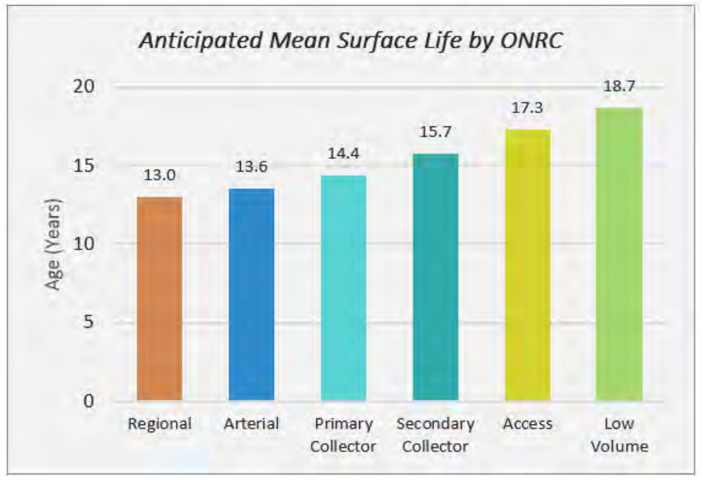
Level of Service Measures



The number of serious & fatal crashes on MDC's network has increased between 2021 and 2022; this total is more than 2018's peak total of 20, and shows a result contrary to the longer term downward trend seen ion the previous four years between 2018 and 2021.



Changed to display the STE for the network, rather than '%'age of network length with peak roughness exceeded' for each classification.
Overall, STE has improved slightly (from approximately 94% to 95%), subsequent to the latest pavement condition data collection. Low Volume/Access roads in particular exhibit the lowest STE.

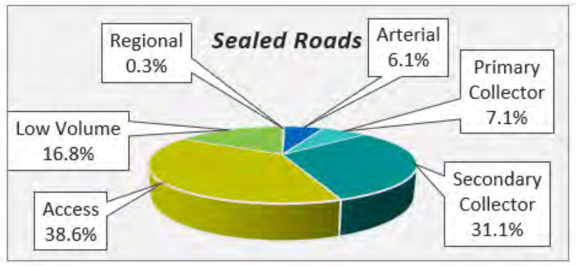


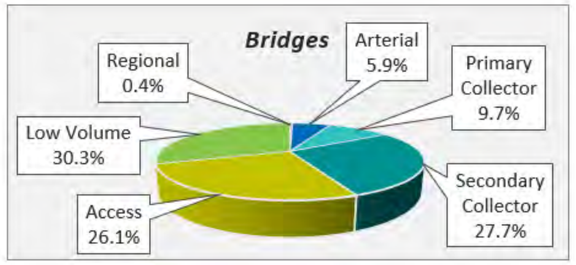
Note: 1st coat seals are excluded from this measure.
Anticipated mean surface life remains comparable with peer networks
Overall, the anticipated surface life has been maintained in comparison with 2021.

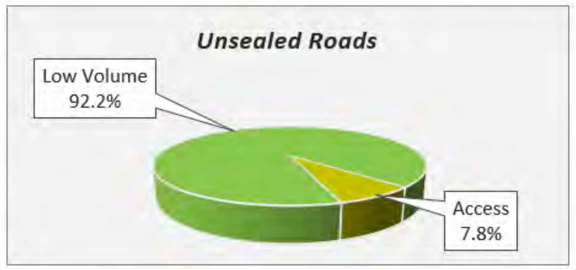
Key Asset Groups

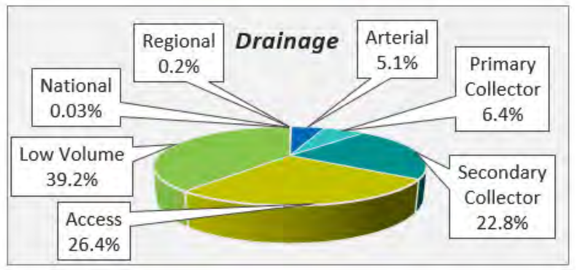
	Asset Type					
ONRC	**Sealed (km)**	**Unsealed (km)**	**Footpath (km)**	**Bridge (No)**	**Drainage (No)**	**Wall (km)**
National High Vol	-	-	-	-	-	-
National	-	-	1.22	-	2	-
Regional	3.50	-	0.72	1	13	-
Arterial	60.73	-	12.14	14	365	0.51
Primary Collector	70.67	-	24.69	23	458	0.28
Secondary Collector	310.94	-	29.73	66	1,636	3.11
Access	386.83	28.82	44.96	62	1,895	2.34
Low Volume	168.29	340.72	38.75	72	2,815	3.32
	1,001.0	369.5	152.2	238	7,184	9.6

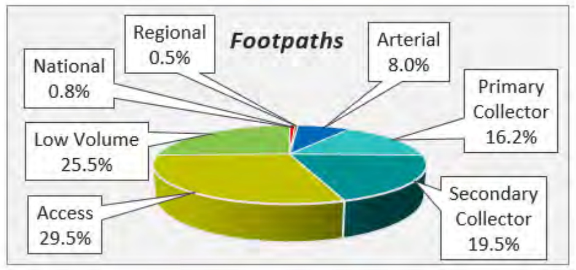
Minor changes in the asset measures since the previous year are primarily a result of improved asset data collection, analysis and processing, along with vesting of sub-divisional / developer roads into the public transportation network.

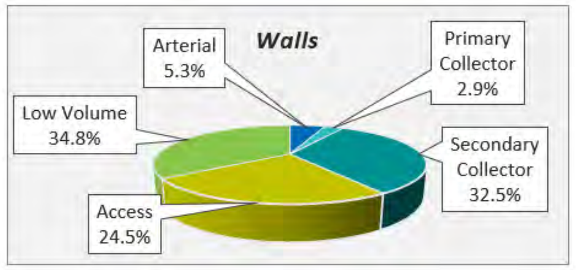


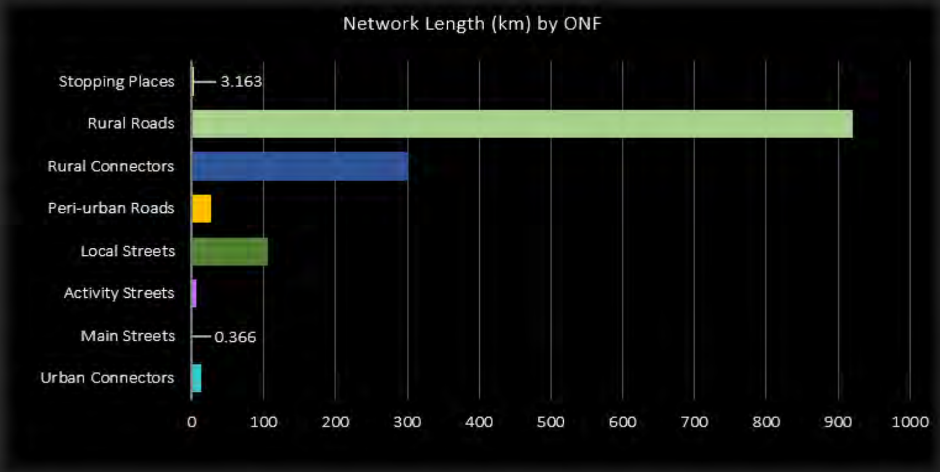


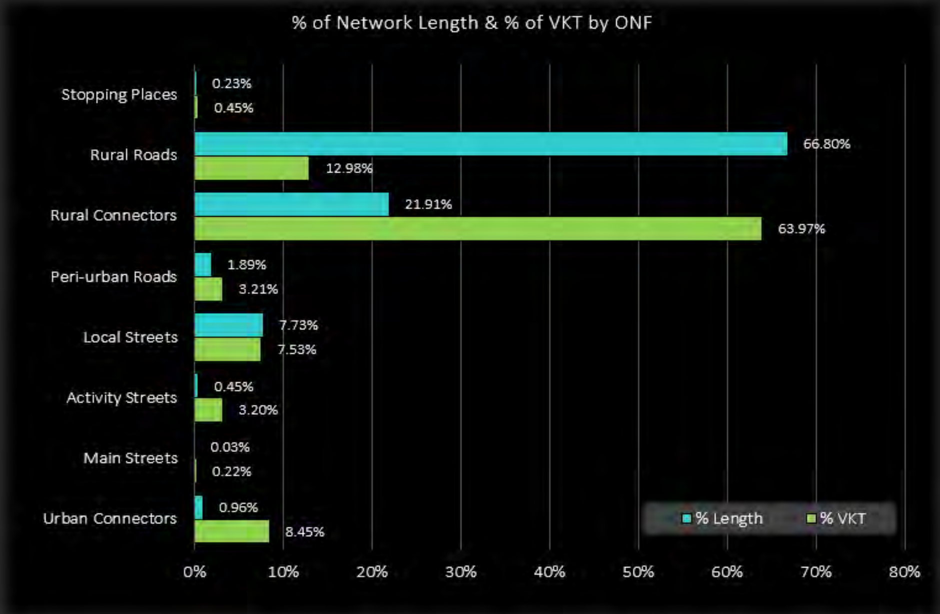




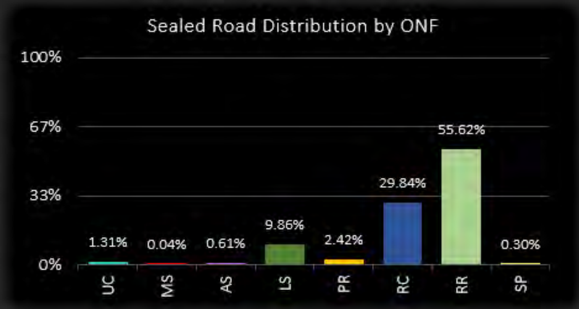


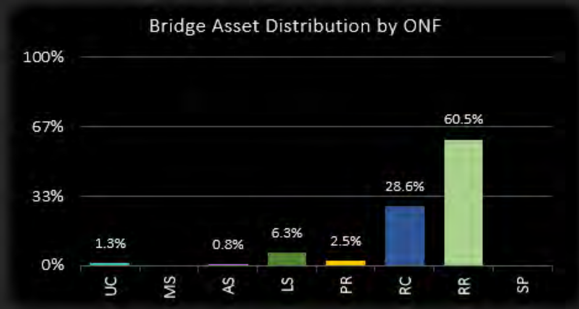


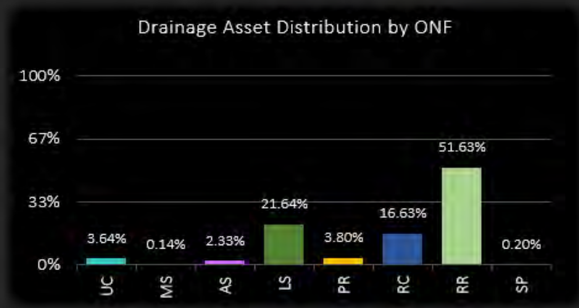


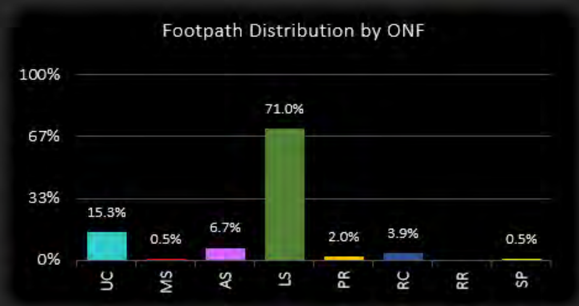


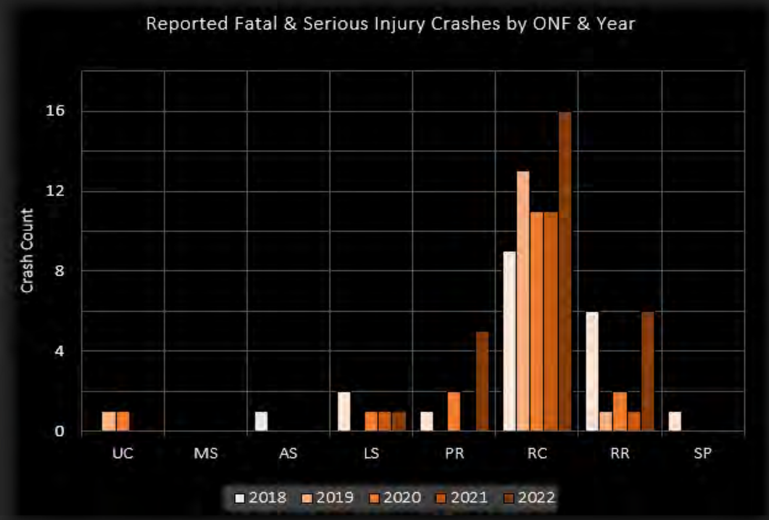
ONF	Sealed (km)	Unsealed (km)	Footpath (km)	Bridge (No)	Drainage (No)	Wall (km)
Transit Corridors (TC)	-	-	-	-	-	-
Interregional Connectors (IR)	-	-	-	-	-	-
City Hubs (CH)	-	-	-	-	-	-
Civic Spaces (CS)	-	-	-	-	-	-
Urban Connectors (UC)	13.29	-	23.23	3	261	0.04
Main Streets (MS)	0.37	-	0.82	-	10	-
Activity Streets (AS)	6.16	-	10.20	2	167	-
Local Streets (LS)	99.81	6.79	107.93	15	1,551	0.35
Peri-urban Roads (PR)	24.49	1.57	3.09	6	272	0.34
Rural Connectors (RC)	302.05	-	5.96	68	1,192	2.46
Rural Roads (RR)	562.99	357.70	-	144	3,700	6.31
Stopping Places (SP)	3.00	0.16	0.74	-	14	0.07
	1,012.1	366.2	152.0	238	7,167	9.6



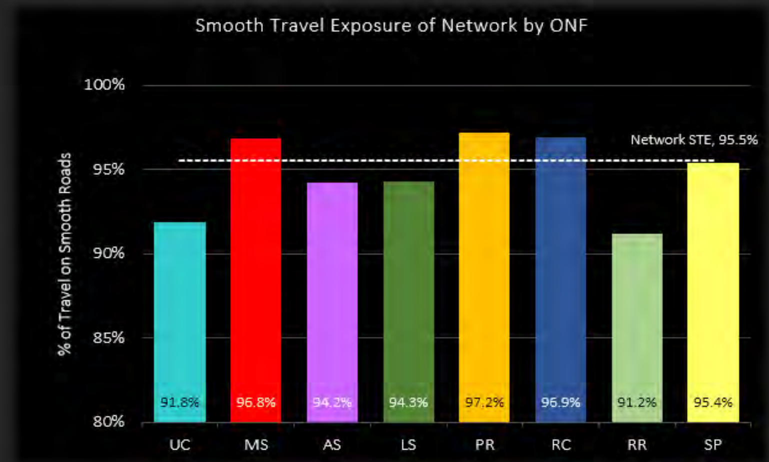




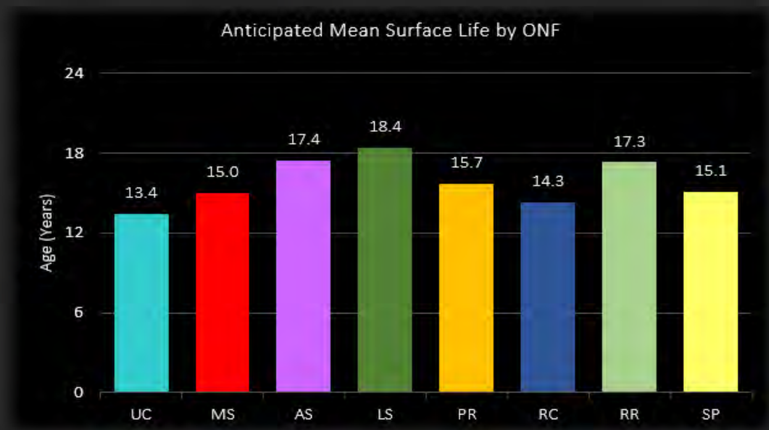




1st year of crash recording displayed by ONF hierarchy:
Majority of F&S crash events located to Rural Connector Roads. Proportion of crashes reflects VKT usage for this classification (i.e. 60 of 93 crashes (64%) mirrors 64% VKT)



1st year of smooth travel exposure measure displayed by ONF hierarchy (NAASRA threshold exceedance(s) calculated using prior ONRC classification):
Urban Connectors / Rural Roads exhibit the lowest readings, but are currently performing in excess of 90% STE



1st year for anticipated surface life displayed by ONF hierarchy:
Shortest lives currently anticipated for Urban and Rural Connectors, aligning with increased traffic volumes generally associated with these classifications

3.2 Value of assets

Valuations of Council assets are undertaken on a regular cycle, with a recent update completed in 2023. The summary costs from this (and the previous) assessment are shown in Table 5 below.

Optimised Replacement Cost (ORC) refers to the cost of building the asset today. It is assumed that modern construction techniques, design codes and modern equivalent materials are used but that the physical result replaces the asset as it exists.

Optimised Depreciated Replacement Cost (ODRC) is the current replacement cost less allowance for physical deterioration and optimization for obsolescence and relevant surplus capacity.

Annual Depreciation (AD) is the amount the asset depreciates in a year, defined as: $\frac{\textit{Replacement Cost - Residual Value}}{\textit{Estimated Total Useful Life}}$

TABLE 5 : ASSET COSTS

Asset Family	*Year*	*ORC ($)*	*ODRC ($)*	*AD ($)*
Roading	2022	1,012,533,660	554,028,853	13,289,336
	2023	1,157,934,773	620,378,517	15,138,357
Difference		145,401,113	66,349,664	1,849,021
		(14.4%)	*(12.0%)*	*(13.9%)*

The network asset ORC can also be portrayed by proportionality; asset types have been aggregated to produce an asset group value distribution, displayed below:

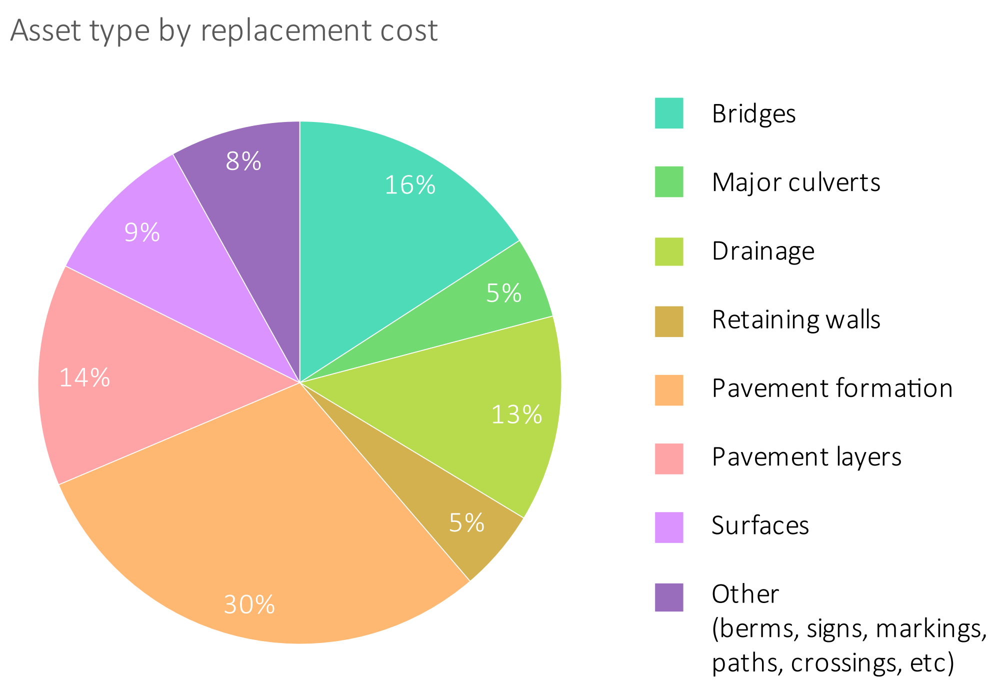


FIGURE 10: ASSET GROUP VALUE DISTRIBUTION

The '*other*' category accounts for all asset types that each comprise less than 5% of the ORC. These assets consist of the district's berms, traffic services (such as signs, road markings, islands, etc), foothpaths, crossings, and unsealed pavements, amounting to 8% of network value. Table 6 below tabulates the aggregated asset grouping:

TABLE 6: ASSET GROUP VALUE DISTRIBUTION

Asset Group	*Replacement Cost*	*% Cost*	*Depreciated Replacement Cost*
Bridges	$184,355,692	15.9%	$79,233,702
Major culverts	$58,769,498	5.1%	$23,322,205
Drainage	$146,999,950	12.7%	$45,157,320
Retaining walls	$58,944,832	5.1%	$48,027,201
Pavement formation	$347,095,298	30.0%	$294,322,881
Pavement layers	$159,522,690	13.8%	$37,567,824
Surfaces	$111,129,319	9.6%	$37,836,369
Other	$91,117,494	7.8%	$54,911,015
Total	*$1,157,934,773*	*100.0%*	*$620,378,517*

Roading asset types are further broken down and reported (an extract of which is included in Part C | Section 5.5). Table 7 below highlights the percentage of assets that have reached the end of their *theoretical* useful life and the associated cost of replacement:

TABLE 7 : ASSETS EXCEEDING THEORETICAL USEFUL LIFE AND REPLACEMENT COST

Asset	*No. of assets*	*% of assets reaching theoretical useful life*	*Replacement cost*
Bridge (Culvert)	2	6%	$1,259,654
Bridge (Deck)	8	5%	$4,034,102
Drainage	45	1%	$13,763
Drainage Wall	10	1%	$13,585
Footpath	155	10%	$4,986,939
Marking [15]	14796	100%	$392,522
Railing	103	7%	$127,607
Sign	3,857	38%	$1,226,273
Streetlight (Bracket)	2	< 1%	$1,409
Streetlight (Pole)	155	15%	$649,058
Vehicle Crossing	15	< 1%	$3,322

More details about the asset quantities and costs, how they have been calculated or measured and inclusions/exclusions can be found in the 2023 Manawatū District Council Roading Valuation Report.

[15] *Pavement markings are renewed on an annual basis. Therefore, end of useful life will always be reached within each financial year, hence the 100% figure displayed*

4.0 Network condition

4.1 Data confidence

It is important to note that the underpinning data, used and maintained in available databases, can include degrees of error or uncertainty. This is mostly due to the origin of some data from less robust, often historic data sources. To understand the level of confidence that can be placed on the data used to inform this assessment, nationally consistent data confidence measures have been used:

Transport Insights Asset Management Data Quality Report: This is an annual report that measures the accuracy, completeness, and timeliness of data that has been captured against a suite of metrics.

The latest report shows that MDC's data can be used with a high degree of confidence given a data score of 93 out of 100 (and improving on last year's results). Further information about data quality measurements can be found on the Transport Insights portal [16].

A key information source used to assess condition and trends are High Speed Data Surveys (HSD's), undertaken at regular intervals. The level of detail collected is related to the road classification. This data is used to assess core data on Council's sealed road network, such as roughness, and further metrics such as rutting, texture depth, and skid resistance to corridors with higher ONRC status.

4.2 Pavement

Information from Transport Insights and analysis of RAMM data has been used to assess the overall condition of the Network. Smooth Travel Exposure (STE) is an output related to a road's roughness and provides insight about the district's core network condition over time.

This information can provide an indication as to whether network condition is stable, improving (through targeted maintenance and renewals), or deteriorating (due to traffic loads, environmental exposure, and/or funding deficit).

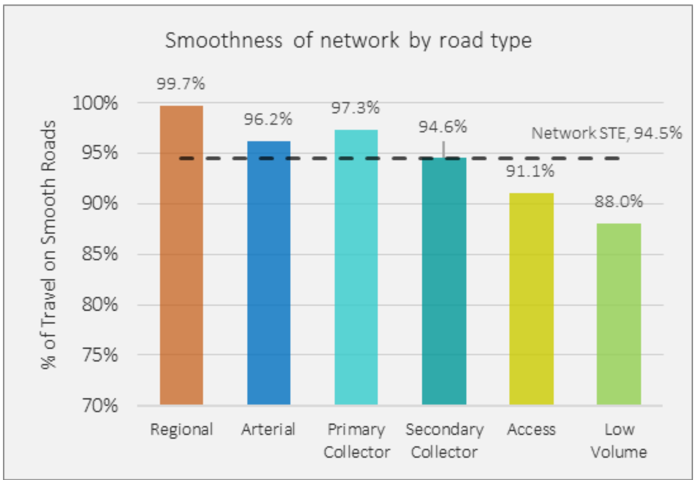


FIGURE 11: LATEST STE MEASURE BY ONRC

STE provides an indication of ride quality experienced by the district's road users. It is indicated as the percentage of road length with a roughness below nationally defined thresholds, weighted by traffic volume measured as Vehicles Kilometres Travelled (VKT).

The roughness count threshold varies, based on road classification and uses the National Association of Australia State Road Authorities (NAASRA) count method. The latest STE analysis, split by ONRC can be seen in Figure 11, whilst the latest 5-year trend is shown in Figure 12 below.

[16] https://pmrt.transportinsights.nz/DataQuality2

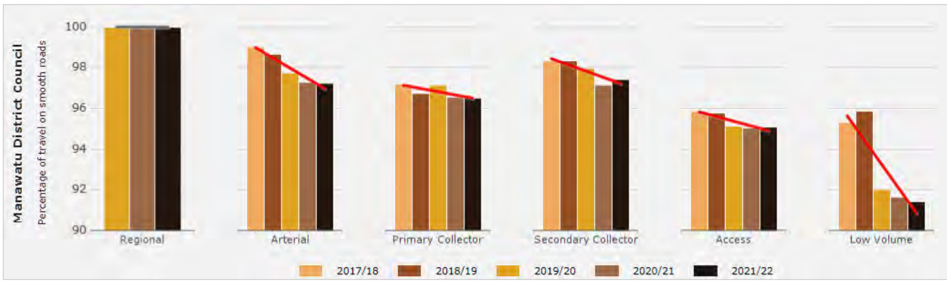


FIGURE 13: PERCENTAGE OF TRAVEL SMOOTHER THAN THRESHOLD (SOURCE: TRANSPORT INSIGHTS)

The data shows that travel on roads smoother than each classification threshold is reducing slightly year-on-year for most road classifications. Low Volume roads in particular exhibited a step change in STE between 2018/19 and 2019/20, subsequently stabilising and are now seen to be declining at a rate commensurate with the remainder of the network. Whilst STE provides an indication of the *prevalence of roughness* affecting travel comfort across the sealed road network, the *extremity (severity) of roughness* is also a useful measure. To gain understanding of this severity, the 85th percentile of roughness counts is determined across each road classification. This statistical measure is shown in Figure 13 below. Whilst Access and Low Volume roads show the highest 85th percentile roughness, the 5-year trend to these roads shows an improving profile. Contrary to this finding, Regional and Secondary Collectors exhibit a moderate increase over the same period. Notwithstanding the network level measures confirming a high standard of core-ride quality, this has the effect of exacerbating the perception of sections where performance is found wanting. To understand more specific trends and improve targeted remedial works, Council's data is comprehensively analysed at varying levels of detail.

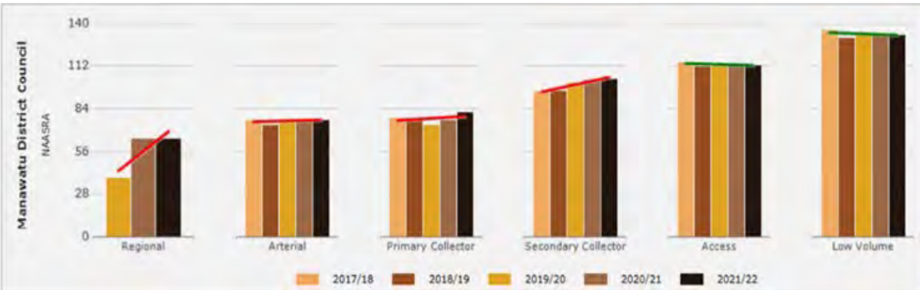


FIGURE 12: 85TH PERCENTILE TREND ROUGHNESS OF ROADS (SOURCE: TRANSPORT INSIGHTS)

Generic Network Level

Analysis of the sealed road network roughness between 2018 and 2022 is plotted in Figure 14 below:

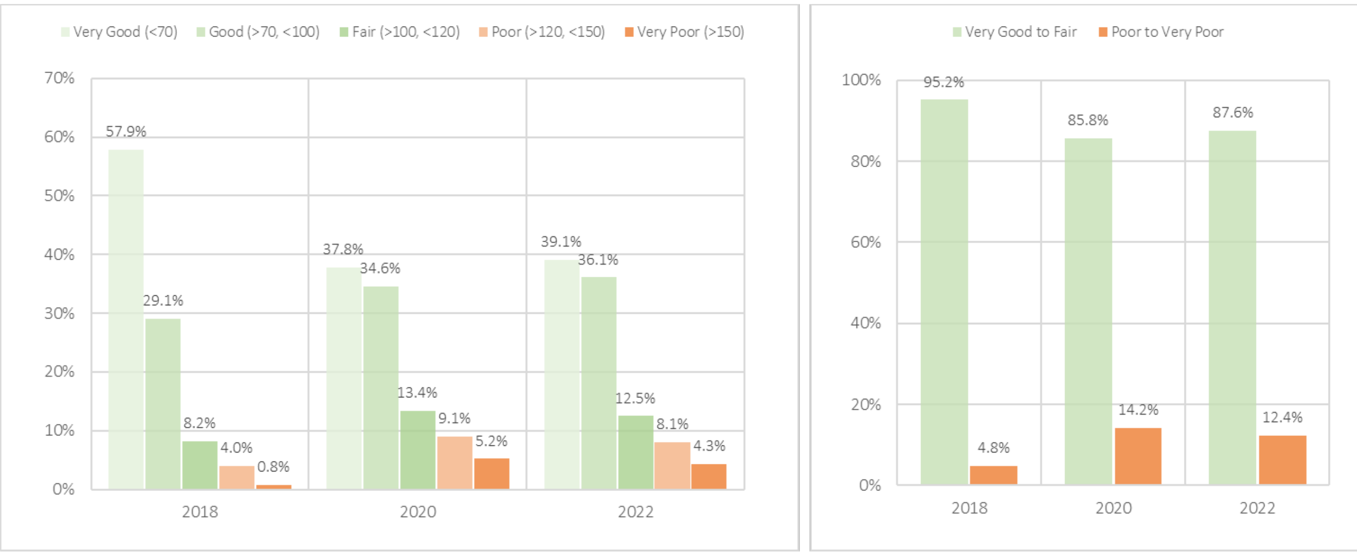


FIGURE 14: GRADED CONDITION RATING FOR NAASRA COUNTS BETWEEN 2018 AND 2022

The latest data indicates that 4.3% of sealed roads have a roughness assessed as very poor (150 NAASRA counts or greater) and 8.1% as poor (between 120 and 150 counts), subsequent to experiencing a step change between 2018 and 2020.

Road Classification Level

The distribution of condition across road classification assists Council in targeting maintenance and renewals more effectively to particular corridors.

Confidence is increased at this level by combining basic roughness with rutting and texture depth data (where available) and applying a Differential Level of Service (DLoS) threshold for each road classification. This DLoS mirrors the level of technicality the Transport Insights tool employs.

Current data indicates that a moderately high proportion of Council's roads are in an acceptable condition, and that maintenance demand reduces as the road hierarchy increases (excepting the recently established 'Regional' portion of the road network; it should be noted that the length of network re-classified as 'Regional' in 2019 amounts to 3.5 km only).

Low Volume and Access level roads exhibit the greatest proportion of maintenance need, when analysed by ONRC.

Armed with this information, Council can conduct a road level analysis within each classification, using the same criteria as above; the output of which can be seen on the next page).

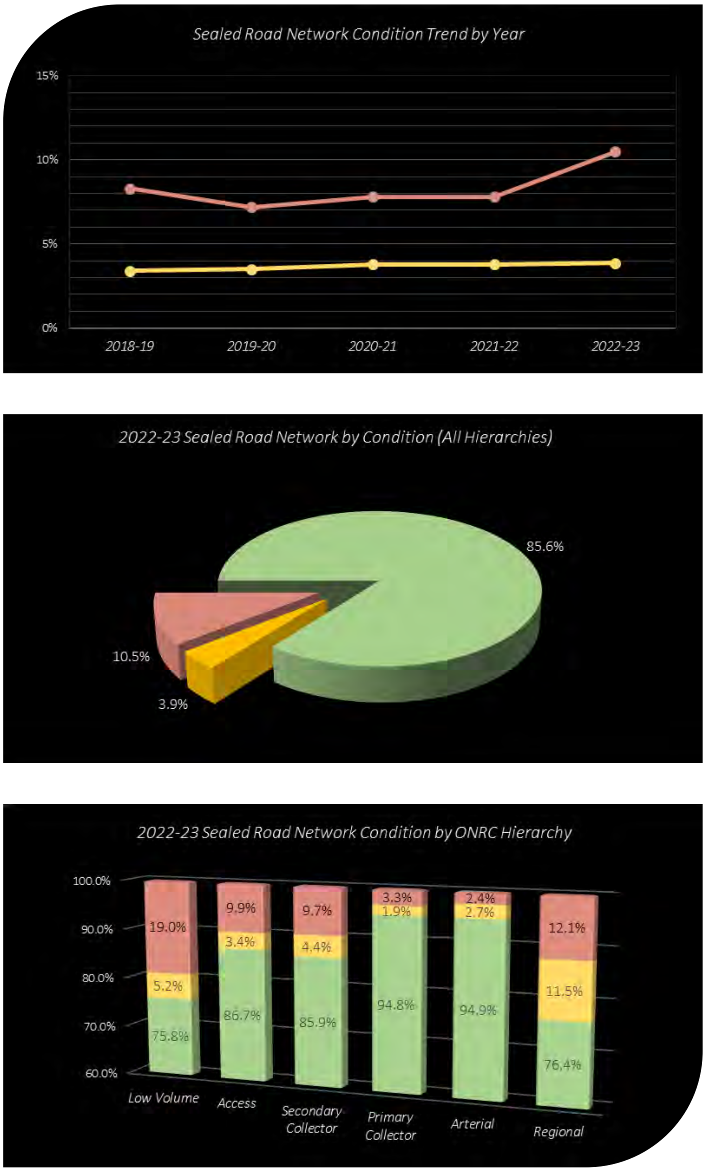


FIGURE 15: NETWORK LEVEL / ROAD CLASSIFICATION CONDITION

Road Section (Treatment Length) Level

Further to road classification level analysis, Council also has the ability to interrogate condition of sub-sections of road, known as Treatment Lengths. In addition to roughness, rutting and texture depth, this level of analysis can make use of additional information held on the RAMM database, such as:

- Skid resistance
- Crash records, and
- Other defect rating data

A sample output of this analysis can be found on the page following the next.

						Score Range		
Roughness	Active	Lower Threshold	110	NAASRA		0	Mapping Thresholds	
Rutting	Active	Upper Threshold	160	NAASRA		100	PCI Lower Threshold :	50
Texture	Active	Lower Threshold	10	mm		0	PCI Upper Threshold :	75
Omit Speed Hump Data Points		Upper Threshold	20	mm		80	Sensitivity (Min. Road Length Assessed) Data Points (300m)	15
Y		Lower Threshold	0.7	mm		0		
		Upper Threshold	0.4	mm		75	Urban, Rural or All Roads :	Rural
Omit OoD Data								
Y		Date Limitation	3	years		Total : 255	ONRC :	Secondary Collector

Top 25 rated (filtered) roads, based on : Mean PCI Score for Secondary Collector - Excluding Urban Roads - with 15 Data Points (300m) Minimum Assessed Length

Rank	Roadname	Mean PCI
1	VALLEY ROAD	39.16
2	ALVE ROAD	38.36
3	SHORT ROAD	36.68
4	LETHBRIDGE ROAD	26.79
5	POHANGINA VALLEY EAST ROAD	26.72
6	GILLESPIES LINE	25.13
7	WATERSHED ROAD	24.19
8	ARANUI ROAD	22.68
9	RANFURLY ROAD	22.23
10	AORANGI ROAD	21.71
11	MT BIGGS ROAD	20.92
12	ARNOTT STREET	20.05
13	PYKE ROAD	19.59
14	HOIHERE ROAD	17.55
15	RANGIWAHIA ROAD	17.25
16	MT STEWART/HALCOMBE ROAD	17.18
17	OROUA VALLEY ROAD	17.13
18	STANWAY ROAD	14.90
19	APITI ROAD	14.88
20	NEWBURY LINE	13.74
21	KARERE ROAD	12.82
22	CEMETERY ROAD (RURAL)	11.56
23	MAKINO ROAD	11.43
24	PHARAZYN ROAD	11.06
25	WILSON ROAD	9.83

Roadname: SHORT ROAD

Filtered Ranking: 3 of 39

Chart Axis Realignment (press this after selecting road)

Survey Date / Date Range : 1/03/2021 to 28/06/2022

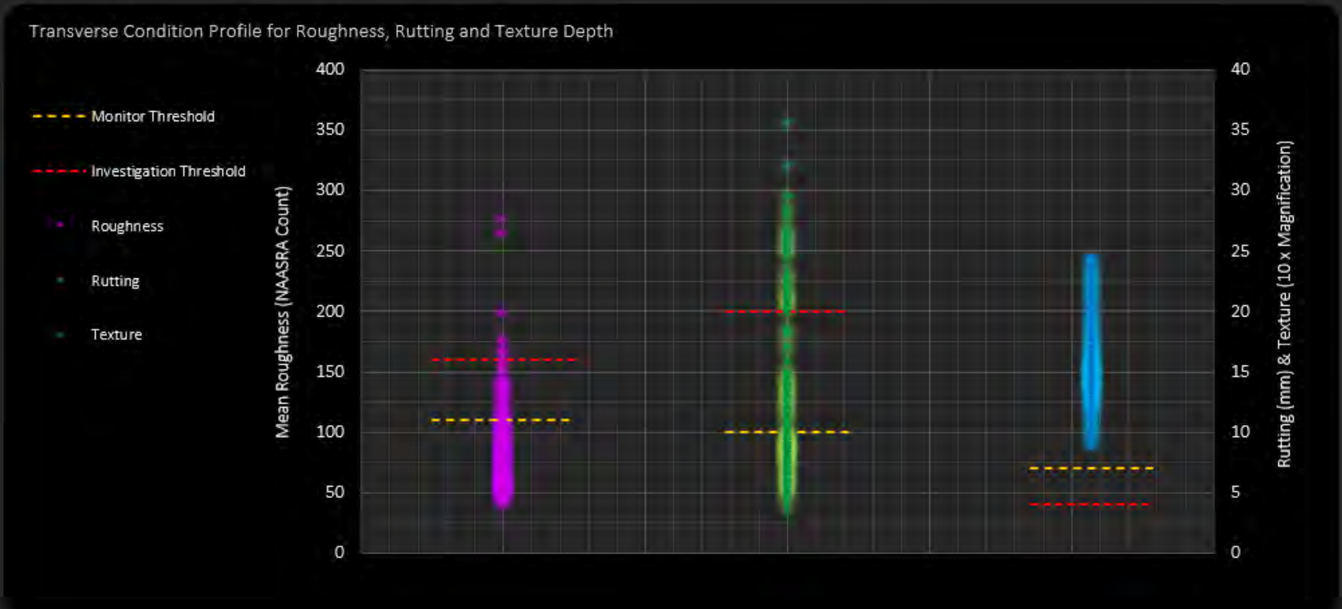
Length Assessed : 3400 m

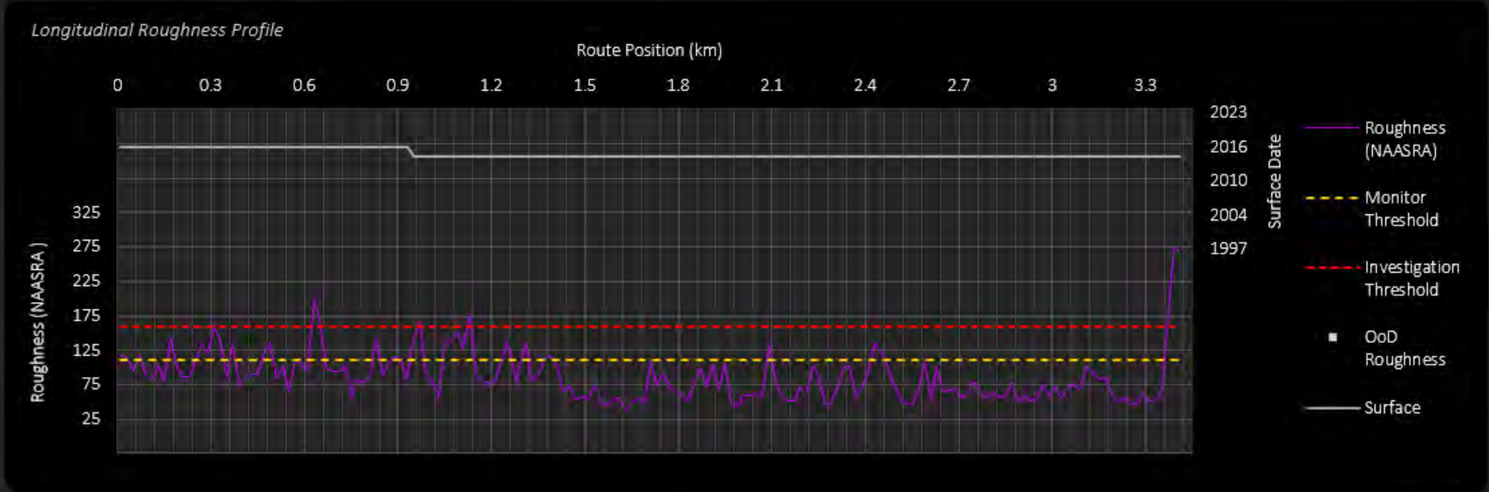
No of Data Points : 171

Activate User Defined Range: N

Start RP: m End RP: m

MANAWATU DISTRICT COUNCIL





Date of Report : 29 June 2023

MANAWATU DISTRICT COUNCIL

HSD Chart Axis Alignment (press after selecting TL No)

Road Identification Data

TL No	9736		
Name	SHORT ROAD	ONRC	Secondary Collector
RP Start	4 m	RP End	935 m
Length	931 m		

Current Surface Data

Surface Type	R 3/5	Date of Seal	24-Jan-17
Current Function	Reseal	Surface Depth (mm)	37
Current Seal Age (Yrs)	6 Years		
Design Life Expiry	2032/33	Expected Life Expiry	2025/26
+/-	-7 Years		

Visual Rating Data

Surface Condition Index (S.C.I.): 0.00 | Ranking:

Defect	Quantity	Unit	%
Alligator Cracks	0	m	0.0%
Potholes	0	No	0.0%
Pothole Patches	0	No	0.0%
Rutting	140	m	1.4%
Shoving	0	m	0.0%
Scabbing	0	sq.m	0.0%
Flushing	115	m	3.1%

Assessment Dimension	Quantity	Unit
Length	931.00	m
Width	5.90	m
Area	5492.90	sq.m
% of Treatment Length Assessed	100.00	%
Overide seal date to see underlying (superseded) data?	No	

Treatment Selection Algorithm (TSA) Recommendation: -

Cumulative Defect %: 4.5%

High Speed Data | Crash History | Road Risk

Date of Latest HSD Rating: 1-Mar-21

10 Year Crash History	Fatal	Serious	Minor	No Injury
	0	0	0	0

Road Risk Rating	Personal	Collective	HRRR
	Low	Low	

	Roughness Mean	Roughness % Exc.	Rutting Mean	Rutting % Exc.
Left Ln	99	15.22%	13.7	20.65%
Right Ln	113	26.09%	14.0	31.52%

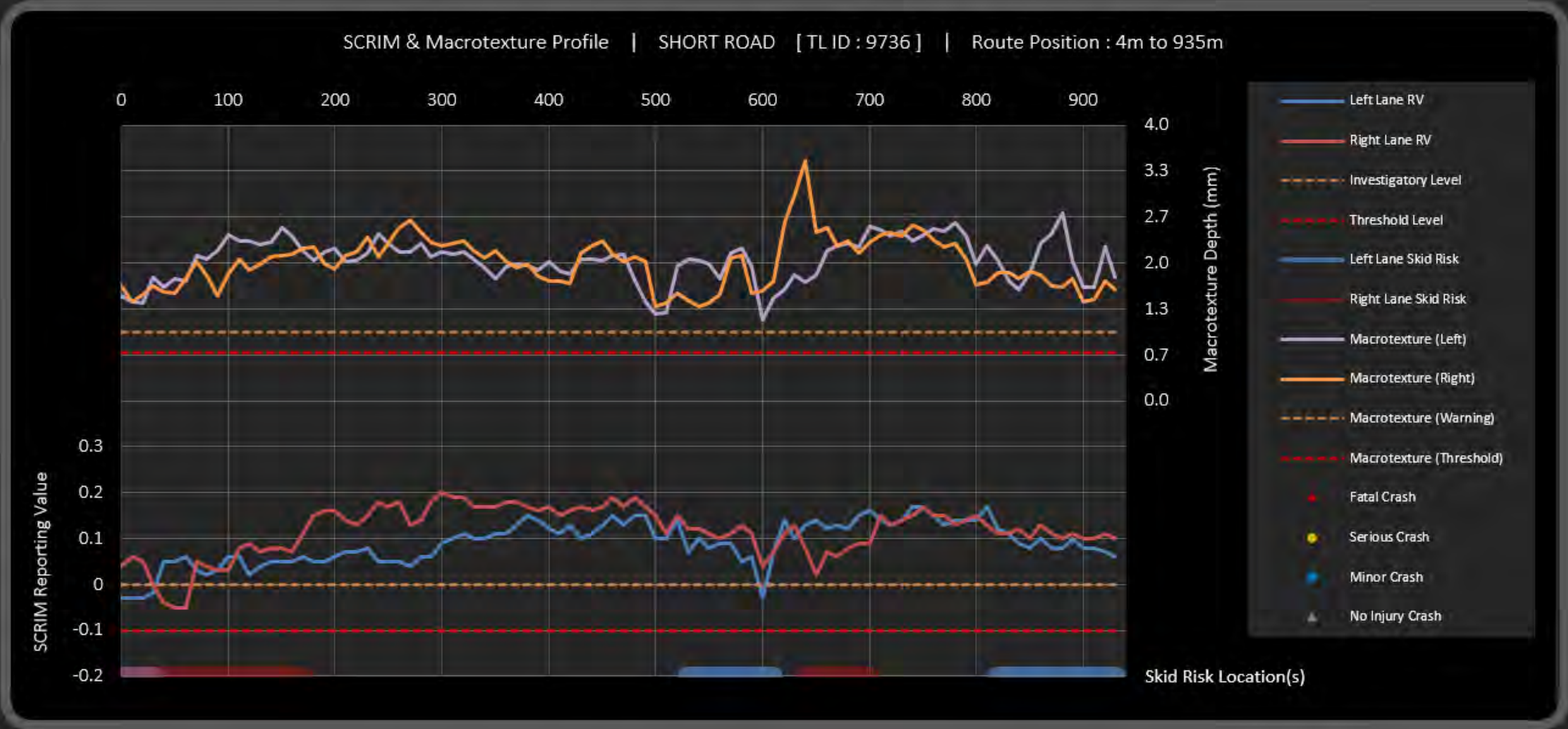
	Mean Readings SCRIM	Mean Readings Texture	Rating Category
Left Ln	0.09	2.04	B
Right Ln	0.12	2.01	

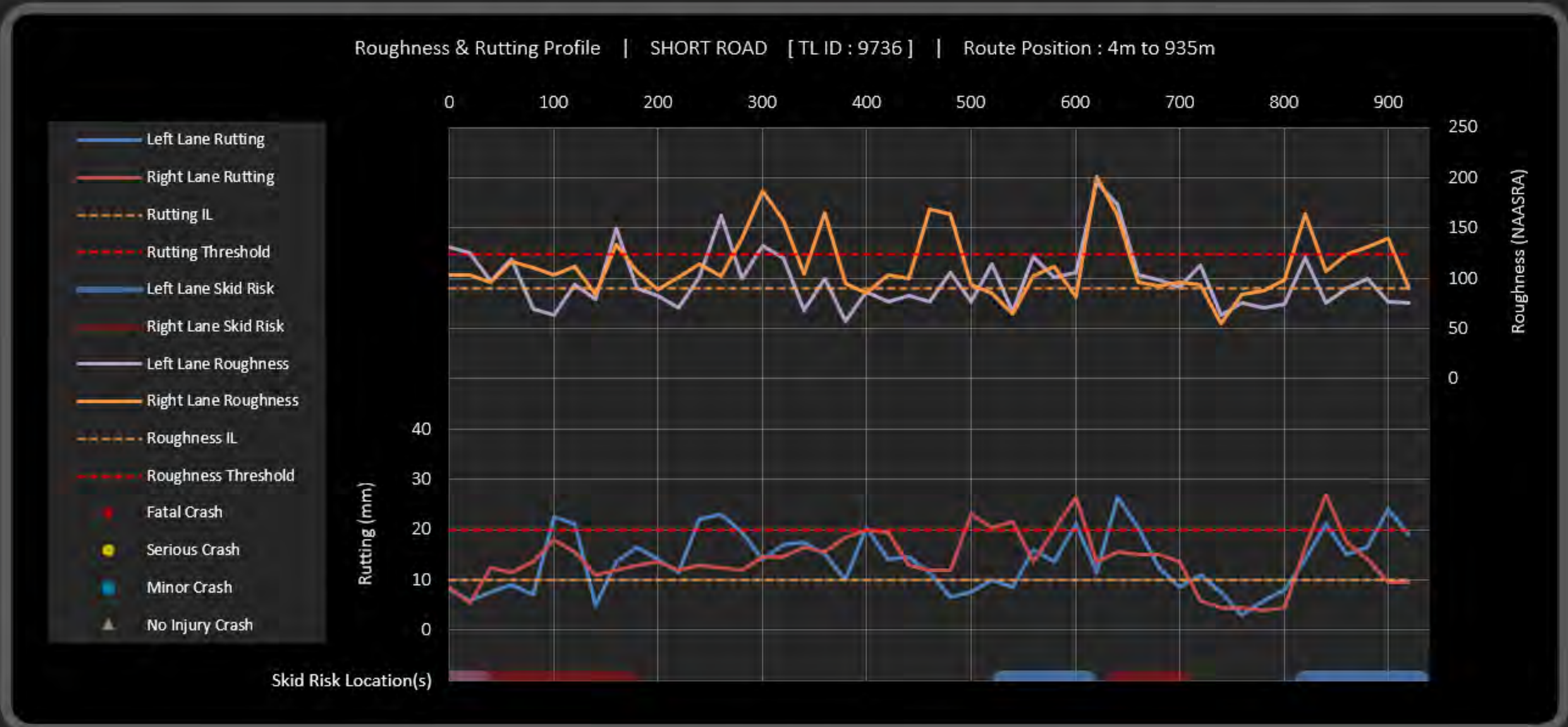
Pavement Condition Index (P.C.I.)	114.34	Ranking	7	Date of SCRIM Rating	1-Mar-21

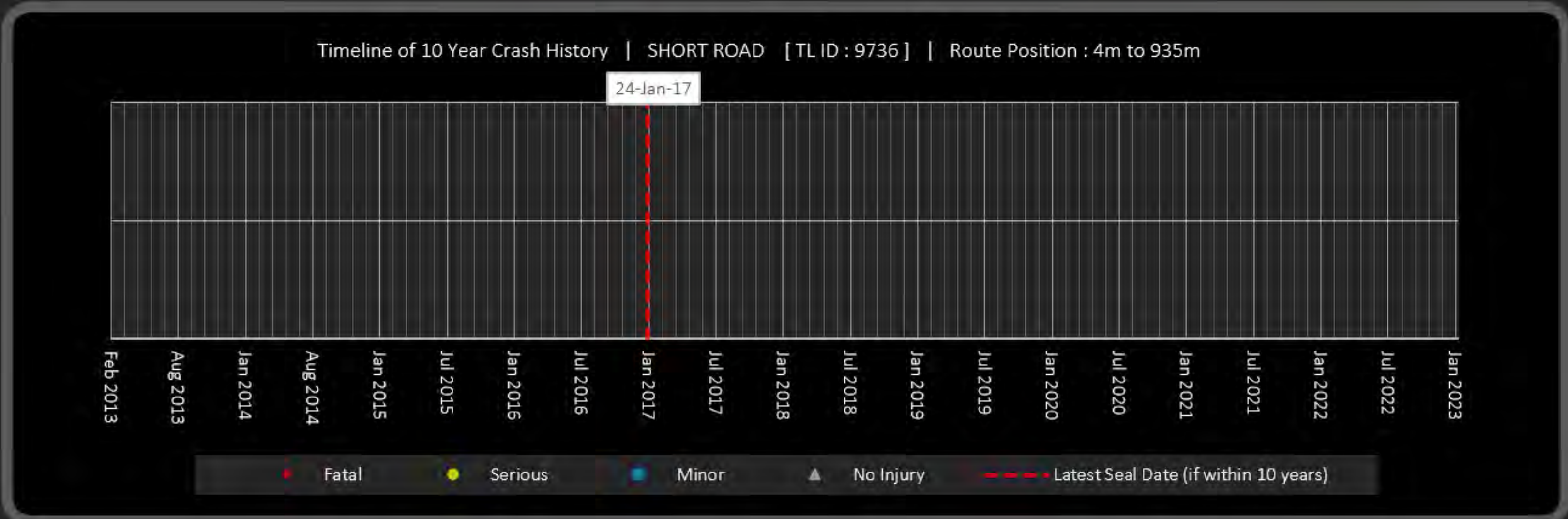
Details | Reason for Treatment

Auto Generated Treatment Reason : High Speed Data Condition

Expected Treatment : Pavement Rehabilitation







4.3 Surfacing

The Transport Insights tool defines '*Average Life*' of surfacing as *"...the average difference in years between the layer date and the removed date, for pavement layers with a Work Category of 214 that have been removed in the last four years."*

Figure 16 shows that, historically, Manawatū has achieved a lower average life than contemporaries in the regional or rural district peer groups for chipseal surfaces.

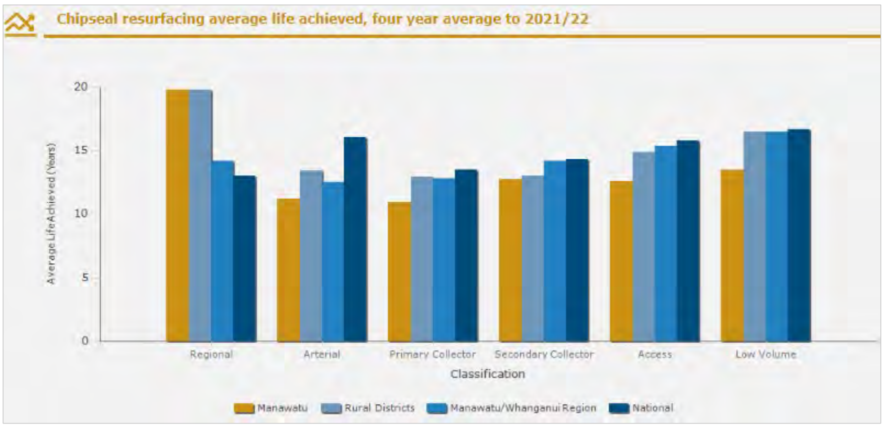


FIGURE 16: MEAN LIFE ACHIEVED WITH CHIPSEAL, 4-YEAR MEAN (SOURCE: TRANSPORT INSIGHTS)

Asphalt surfacing comprises a small portion of the Manawatū sealed road network at 1.4% length only. Keeping in mind the small quantity of this surface type - and its consequent limitation in assessing performance - Transport Insights indicates that Manawatū has achieved comparable seal life to its peer groups (see Figure 17 below).

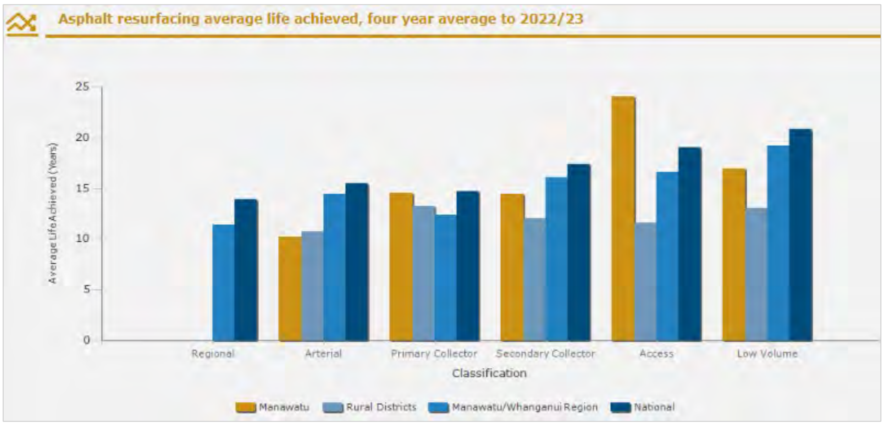


FIGURE 17: AVERAGE LIFE ACHIEVED FOR ASPHALTIC SURFACING, 4-YEAR AVERAGE (SOURCE: TRANSPORT INSIGHTS)

However, it must be noted that Council has proactively realigned its resurfacing programme to address these findings, focussing purely on condition as the driver for renewals, and discarding the legacy 'birthday seal' / age as a usable metric. Over time, this has seen the '*average age of seal*' trend upwards (see the lefthand chart in Figure 18 below). As a consequence of this realignment, the anticipated seal life of Council's network has extended to that shown in the righthand chart in Figure 18.

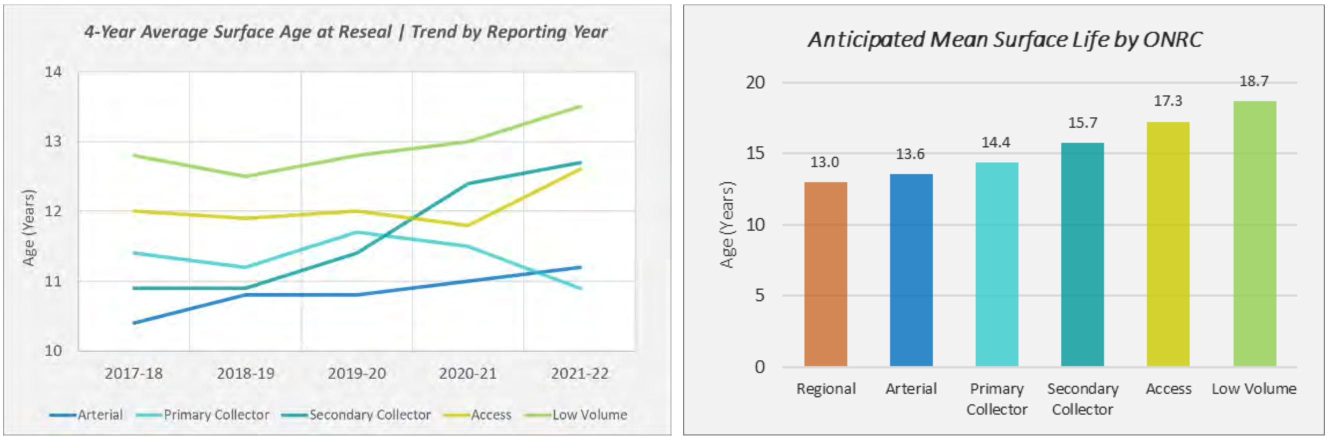


FIGURE 18: ACHIEVED AND ANTICIPATED SEAL LIFE TRENDS

4.4 Bridges and major culverts

WSP has conducted an update to the 2019 Lifecycle Structures Management Plan (LCMP) on behalf of MDC in 2023.

MDC's portfolio currently consists of 241 Local Authority owned road structures and 51 privately owned stock underpasses:

TABLE 8: BRIDGE STRUCTURES PORTFOLIO

Structure type	*Owner*	*Count*
Road Bridge	MDC	140
Major Culvert	MDC	101
Stock Underpass	Private	51
Total		292

FIGURE 19: BRIDGE STRUCTURES ASSET MAP

Stock underpasses are included in the portfolio so that MDC's responsibility to inspect said structures is achieved (*note: the responsibility for maintenance and renewals remains with each owner*). The replacement value for the portfolio MDC owned assets (excluding stock underpasses) equates to $211.5 million (see latest valuation summary under Section 5.5 Part C | Asset Management)

Based on observations of the network by qualified Engineers, Council's structure portfolio is generally considered to be in 'fair' condition. Over the next 3-year cycle, all structures will be inspected at least once, and will include an overall condition assessment, which will allow for more detailed analysis to be incorporated into the next LCMP.

Road Bridges

MDC is responsible for wide range of bridge types throughout the network, each differing in construction, materials, spans, span lengths, and widths. This heterogeneity necessitates complex demands in both maintenance and renewal management of this asset group. The average age of MDC's Road Bridge Stock is 61 years, which is representative of the wider New Zealand bridge stock. With a typical expected service life of 100 years for bridges, this indicates that the bridge stock is aging, and that increased maintenance expenditure would be expected to retain the current levels of service.

Major Culverts

Major culverts are included where the cross-sectional area spanned by the structure exceeds 3.4m^2.

Culverts are less complex in general and have a lesser variability in construction arrangement, size, and material than bridges. There are 89 in-situ or precast concrete culverts recorded in RAMM, comprising 88% of Council's major culvert assets. Overall, these tend to be simple, low-risk structures with limited structural maintenance requirements.

However, Council also maintains 9 buried corrugated metal/aluminium culverts around the network. These are of a high-risk structure type, with a track record of varying performance and longevity, resulting in expected service lives in the order of 50-55 years. The limited life of these culverts is typically associated with poor construction, poor detailing, or application in the wrong environment. The current average age for this structure type in the Manawatu District is 46 years.

Council's portfolio also includes 3 water drives (unlined, hand dug tunnels through rock). These can present a high-risk as they are dependent on the material through which they have been driven and are subject to normal geological processes and erosion. An inspection of these structures by an experienced geologist was completed in 2022. This identified no immediate, high risks due to condition or form.

Capacity and Restrictions

Structures are generally designed to accommodate all weight classes of vehicle. However, there are circumstances where a structure is unable to safely carry certain traffic loads. If a bridge has been assessed as such, it becomes 'posted', and its limitations published. There are currently 5 posted bridges on the local road network:

TABLE 9: POSTED BRIDGES

Bridge	*Structure Name*	*Restriction(s)*
S37	Coulter Line	44,000kg (Gross)
S299B	Umutoi North Road	44,000kg (Gross)
S142A	Mangarere Road	6,500kg (axle) 34,000kg (Gross) 30kph
S434	Piripiri Water Drive	6,000kg (Gross)
S173C	Otara Bridge	6,000kg (Gross) 30kph

FIGURE 20: POSTED BRIDGE LOCATIONS

One Lane Bridges (OLB's) are relatively common throughout New Zealand, and were habitually installed on low volume roads, where the incidence of meeting opposing traffic is rare. Some roads have experienced traffic volume growth, increasing the likelihood of a vehicle encountering another travelling in the opposite direction. Council has mapped the locations of OLB's on its network where the traffic volume is now in excess of 250 vehicles per day (vpd).

FIGURE 21: ONE LANE BRIDGE LOCATIONS (ROADS > 250 VPD)

TABLE 10: ONE LANE BRIDGES (ROADS > 250 VPD)

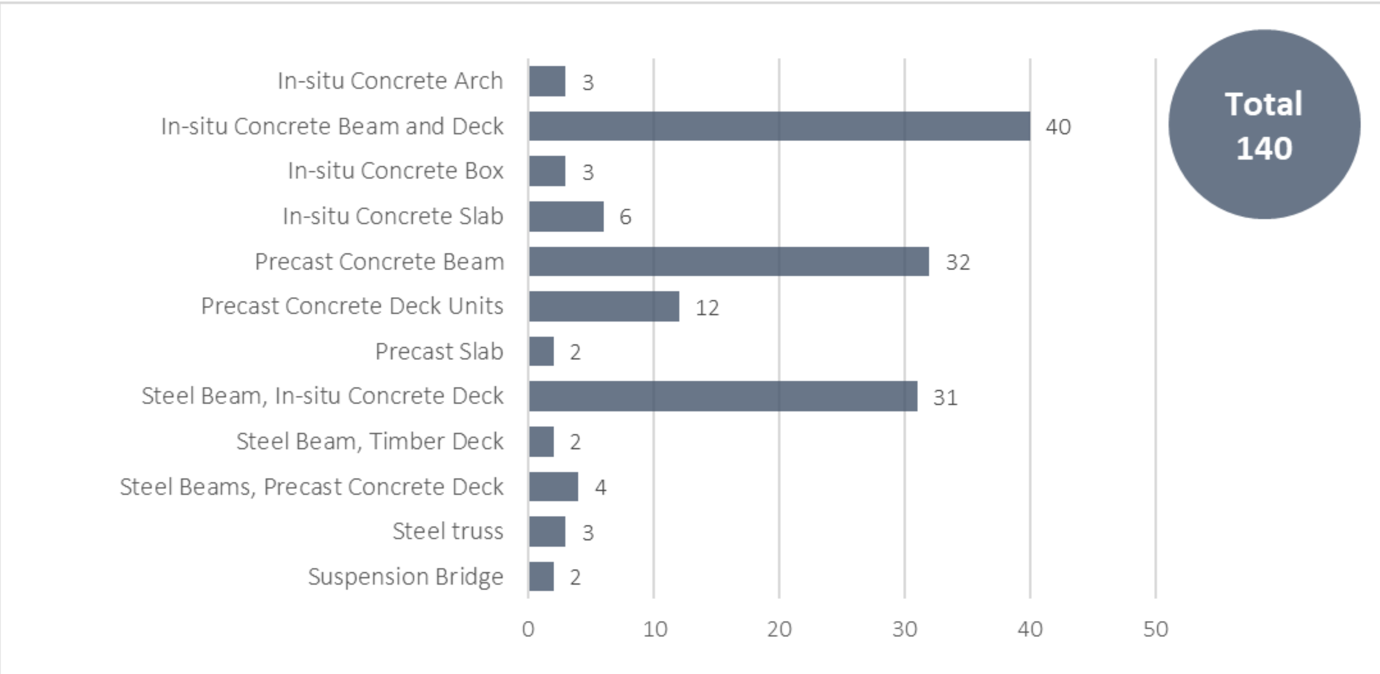
Bridge	*Structure Name*	*vpd*	*Age*
S34	Colyton Road	910	57
S78	Kaimatarau Road	280	110
S96	Leen Road	443	110
S103	Lockwood Road	352	22

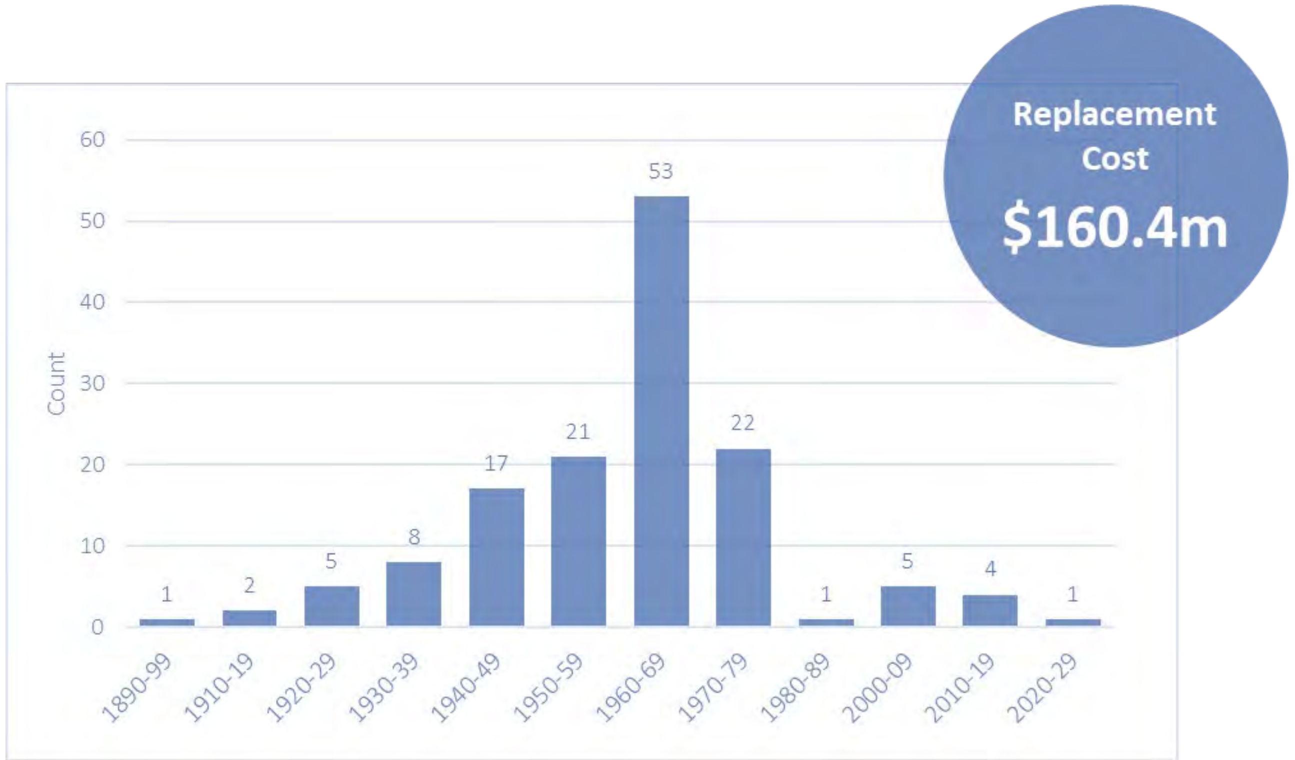
A summary of 'Road Bridge' and 'Major Culvert' structure types and associated age profiles can be found on the following page.

Structure Portfolio | Type Profile

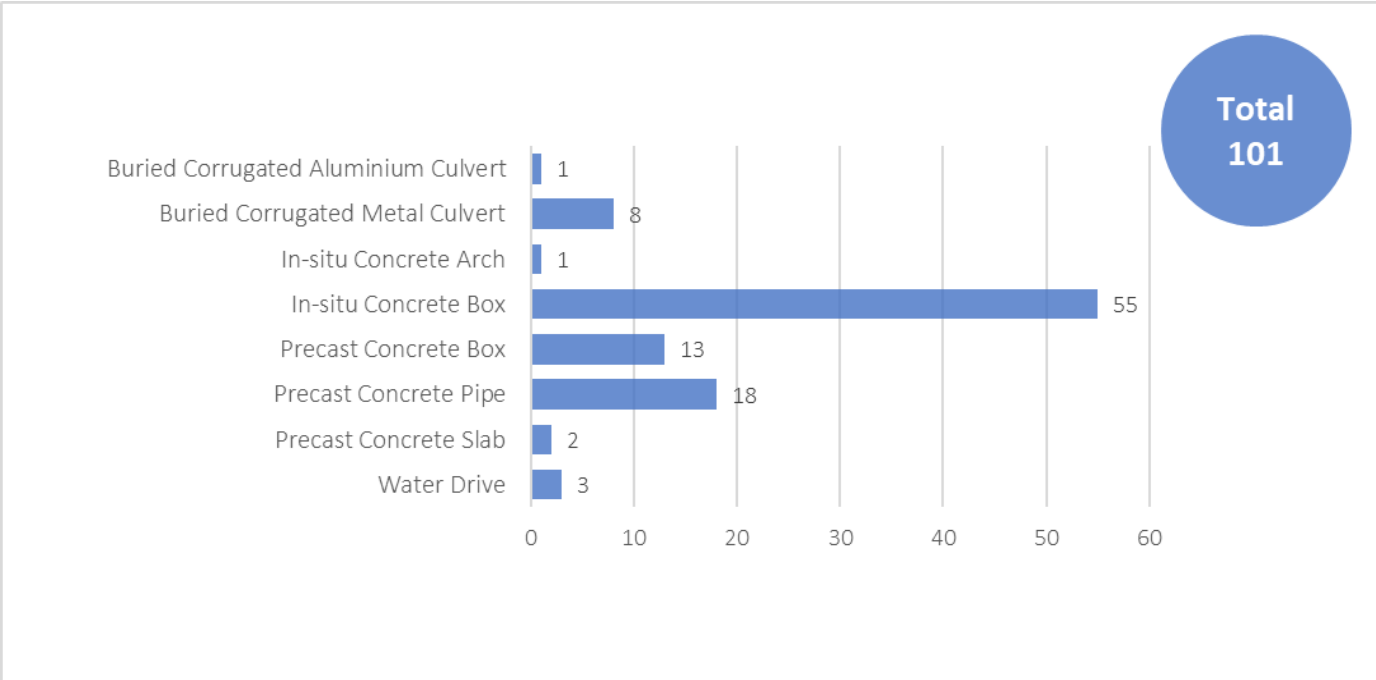
Structure Portfolio | Age Profile

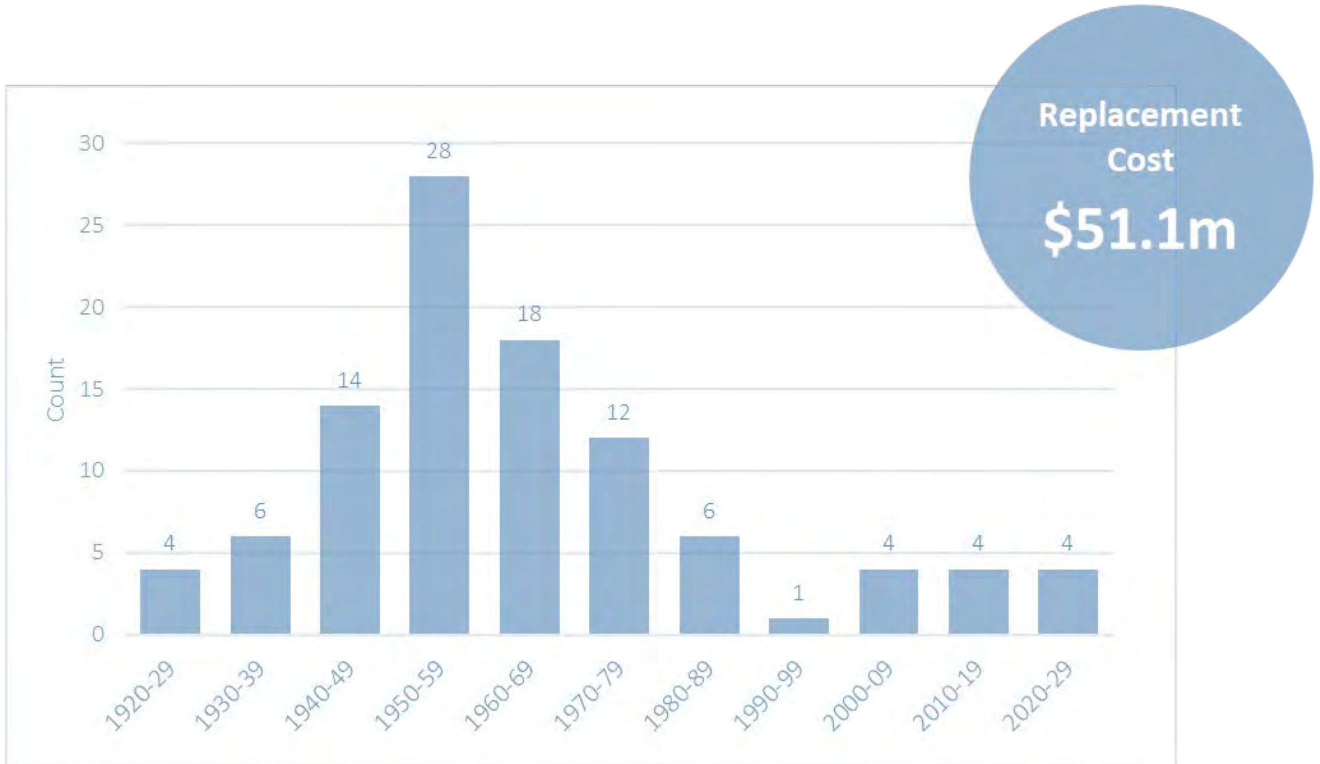
Road Bridges





Major Culverts





4.5 Footpaths

Condition surveys of the footpath network are undertaken every 3 years, given the gradual deterioration generally anticipated for such assets. Sections of path are rated between Excellent and Very Poor, depending on the nature and extent of defects observed. Using the last 3 surveys (between 2014 and 2020), footpath condition is plotted in Figure 22 below:

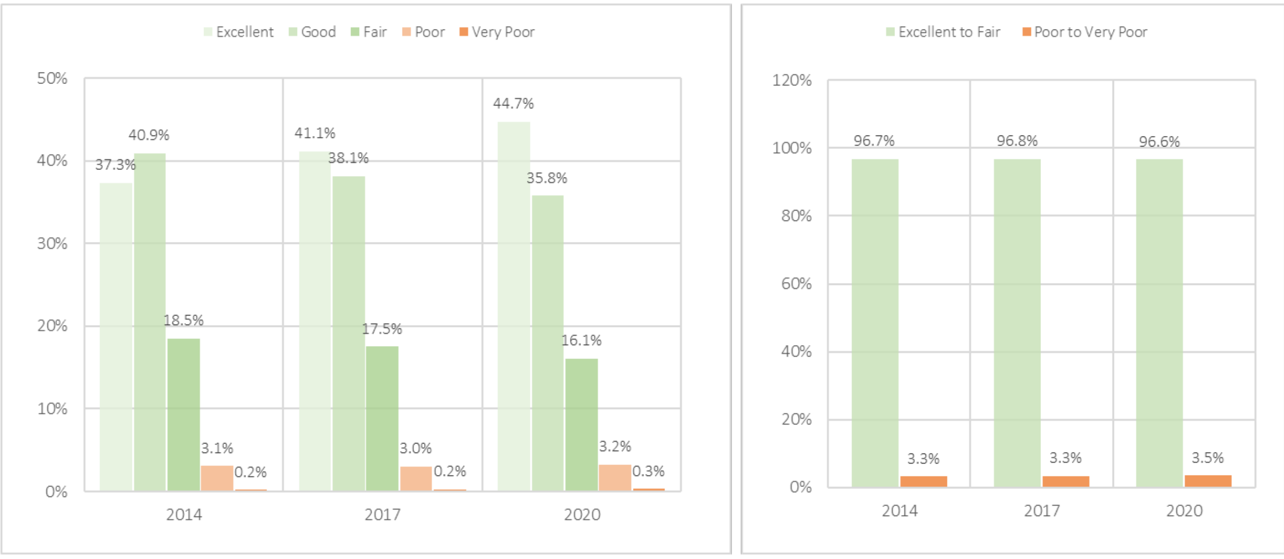


FIGURE 22: GRADED CONDITION RATING FOR FOOTPATHS BETWEEN 2014 AND 2020

The latest data indicates that just 0.3% of paths have a condition assessed as very poor and 3.2% as poor. Overall, aggregated condition (combining 'excellent to fair' and 'poor to very poor' grades) has remained virtually static between 2014 and 2020, indicating that interventions and investment have been set at a suitable level.

Asset Profile

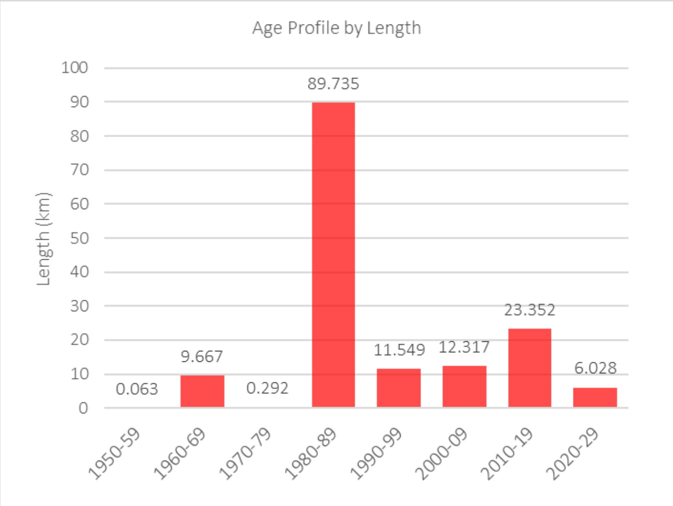
The majority of the district's footpaths are constructed from concrete (81%), and primarily located throughout its urban locales. The majority of aesthetic / high amenity paths (Asphaltic Concrete (AC), Interlocking Block and Herringbone, comprising 16% of length) are located to Feilding town centre, whilst the remainder of path types (comprising 3% of length) are commonly found to more rural locations:

TABLE 11: FOOTPATH ASSETS

Footpath Type	*Area (m^2)*	*Length (m)*	*% Length*
AC Panel with Tile Border	1,098	322	0.2%
Asphaltic concrete	58,316	20,955	13.7%
Concrete	180,173	123,876	81.0%
Interlocking blocks	6,520	1724	1.1%
Limestone path	5,519	2,204	1.4%
Metal	147	98	0.1%
Monier Tile Herringbone	5,220	1,261	0.8%
Chipseal	6,460	2,563	1.7%
Total	***263,453***	***153,003***	

FIGURE 23: AGE PROFILE BY FOOTPATH ASSET COUNT

Analysing the age profile by 'length' and 'area' produces profiles similar to the 'age profile by asset count' displayed above:



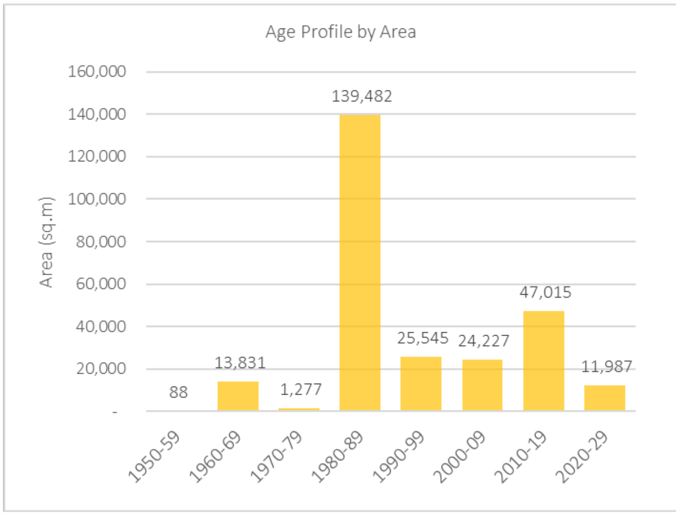


FIGURE 24: AGE PROFILE BY FOOTPATH LENGTH (KM) AND AREA (M^2)

The current average age of all recorded footpath assets is 28 years and the average, theoretical useful asset life is 55 years. 818 path sections (43.3% of assets, constituting 58.6% of length or 52.9% of area) will be reaching the end of their theoretical useful life between 2035 and 2045.

In combination with the evidenced condition profile, a more comprehensive Forward Works Programme will be needed to smooth out this theoretical peak demand to a level that is both manageable when:

- Rating customers for funding, and
- For procurement and retention of resource

4.6 Expenditure profile and efficiency

4.6.1 Expenditure distribution

Table 12 below and Figure 25 on the next page show MDC's spending distribution on maintenance, rehabilitations, reseals, and other asset renewals between 2018/19 to 2021/22. The historic spend during this period was largely consistent across all activities, with maintenance accounting for approximately 53% (and renewals 47%) of expenditure.

TABLE 12 : EXPENDITURE 2018/19 TO 2021/22

Activity	*2018/19*		*2019/20*		*2020/21*		*2021/22*	
Maintenance	$4,982,288	52%	$5,340,220	53%	$5,214,598	54%	$5,420,703	54%
Rehabilitation	$1,568,934	16%	$1,375,565	14%	$1,340,674	14%	$1,135,033	11%
Reseal	$1,668,842	18%	$2,097,300	20%	$1,995,989	20%	$1,939,667	19%
Renewals [17]	$1,285,900	14%	$1,290,000	13%	$1,156,882	12%	$1,642,078	16%
TOTAL	***$9,505,964***		***$10,103,085***		***$9,708,143***		***$10,137,481***	

[17] *Note that renewal costs include drainage, footpath, structural, and traffic services assets*

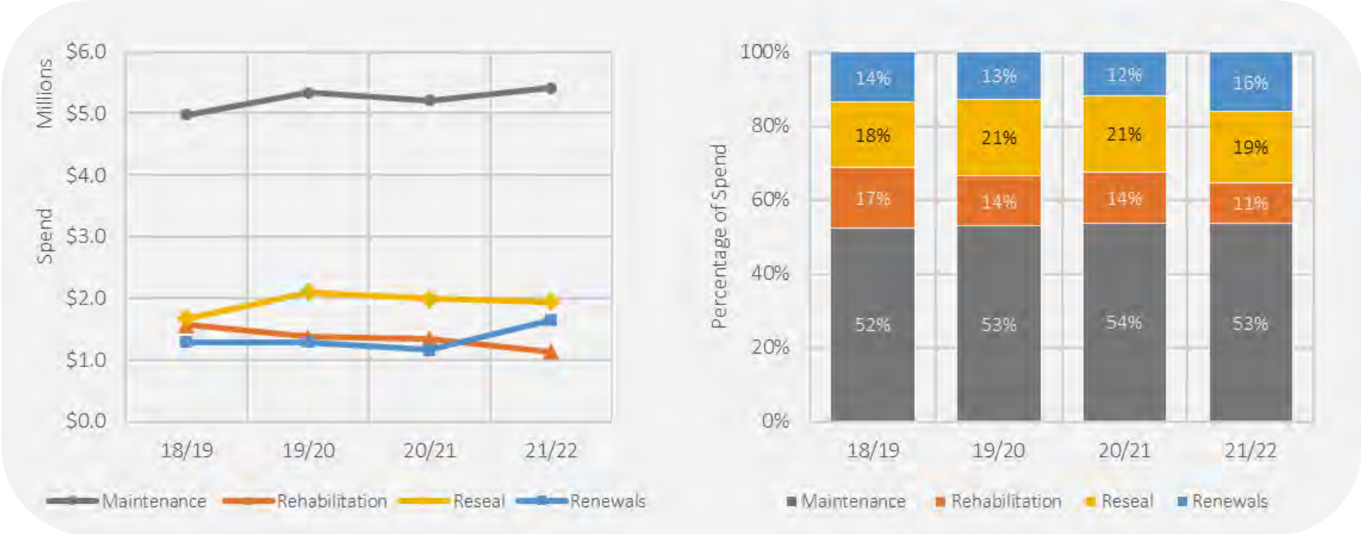


FIGURE 25: MAINTENANCE / RENEWALS EXPENDITURE AND APPORTIONMENT BETWEEN 2018/19 AND 2021/22

Although maintenance is an essential part of preserving the standard of roads, it does not entirely prevent degradation; therefore, renewals are important in sustaining the overall condition of the network, preventing maintenance backlogs reaching unsustainable proportions.

4.6.2 Expenditure efficiency

The expenditure profile for Maintenance, Operations and Renewals (MOR) is assessed on a rolling 3-yearly cycle by - and for - Manawatū District Council. It is assessed against its:

- Neighbours within the Manawatū-Whanganui region, and
- Peer group '*rural districts*' (as defined in Transport Insights)

measuring 'value for money', using the 3-yearly average cost against either each km of network length or per 100 million Vehicle Kilometres Travelled (VKT). Furthermore, assessment of 'grouped activities' is undertaken, collating expenditure into:

- Network and Asset Management
- Pavement and Surfacing
- Corridor
- Environment and Drainage
- Structures, and
- Footpaths

An output of the analysis dashboard can be found on the following page, showing where MDC sits within Manawatū-Whanganui Region with the last 3 years of cost data:

Selected Cost Comparator - Region | Manawatu-Whanganui

Selected Road Controlling Authorities (RCAs)

RCA	Colour
Horowhenua	
Manawatu	
Palmerston North	
Rangitikei	
Ruapehu	
Tararua	
Whanganui	

Select RCA's by Comparator: Region | Manawatu-Whanganui

RCA Focus: Manawatu

Update RCA Comparator Selection

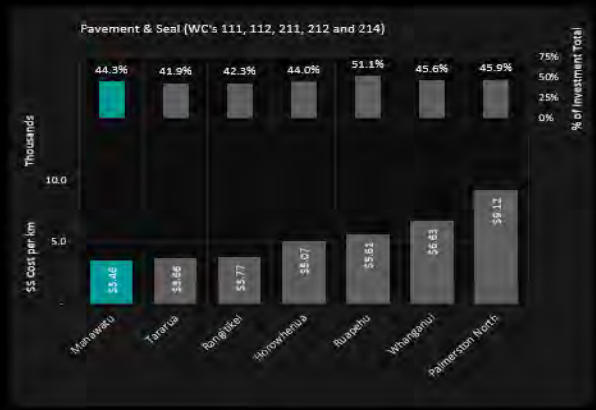
Update Chart Scales & Colour Coding

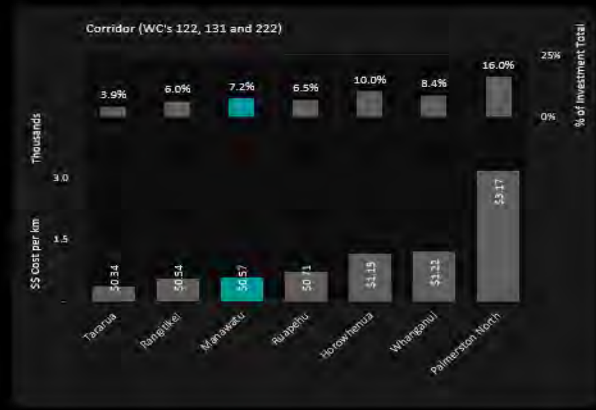
Cost comparison | $$ by network length, combined into activity groups

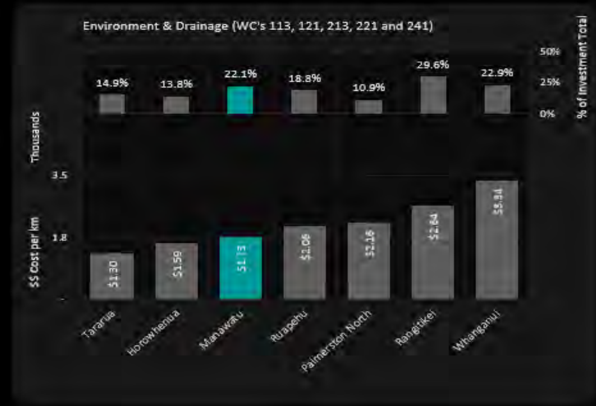
This section details the transport-related expenditure on **Maintenance, Operations and Renewals** funded by Waka Kotahi New Zealand Transport Agency (WK NZTA share) and Approved Organisation(s) (local share).

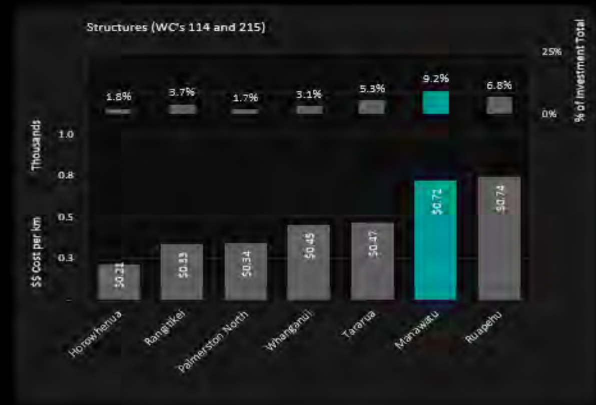
Individual Work Categories (WC's) are combined by WK NZTA to report on expenditure of related activity groups for all Road Controlling Authorities (RCA's) in New Zealand.

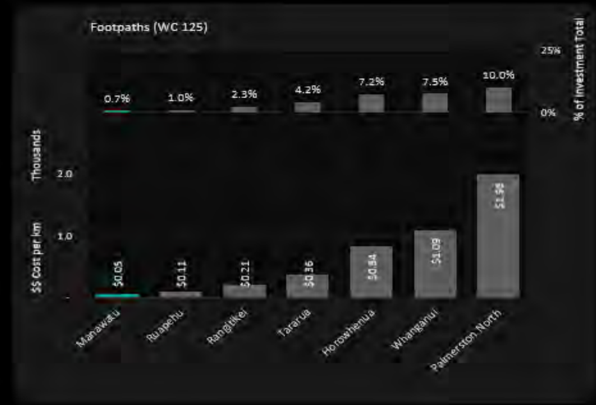
MDC has collated this information (averaging the latest 3 years of data,) and has highlighted Council's proportion and cost per km of network against selected RCA's.



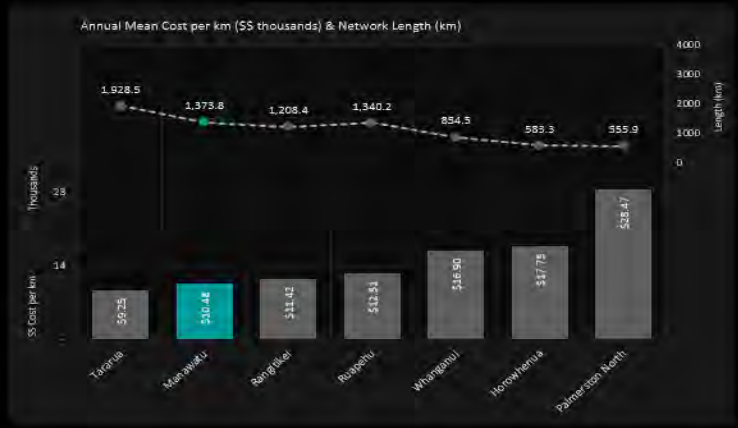


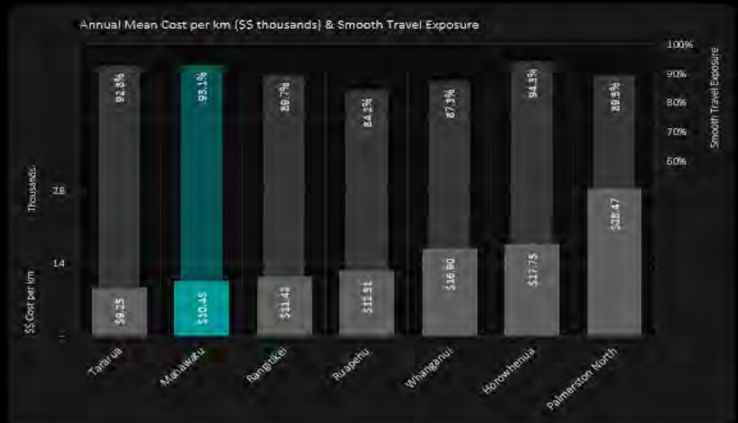




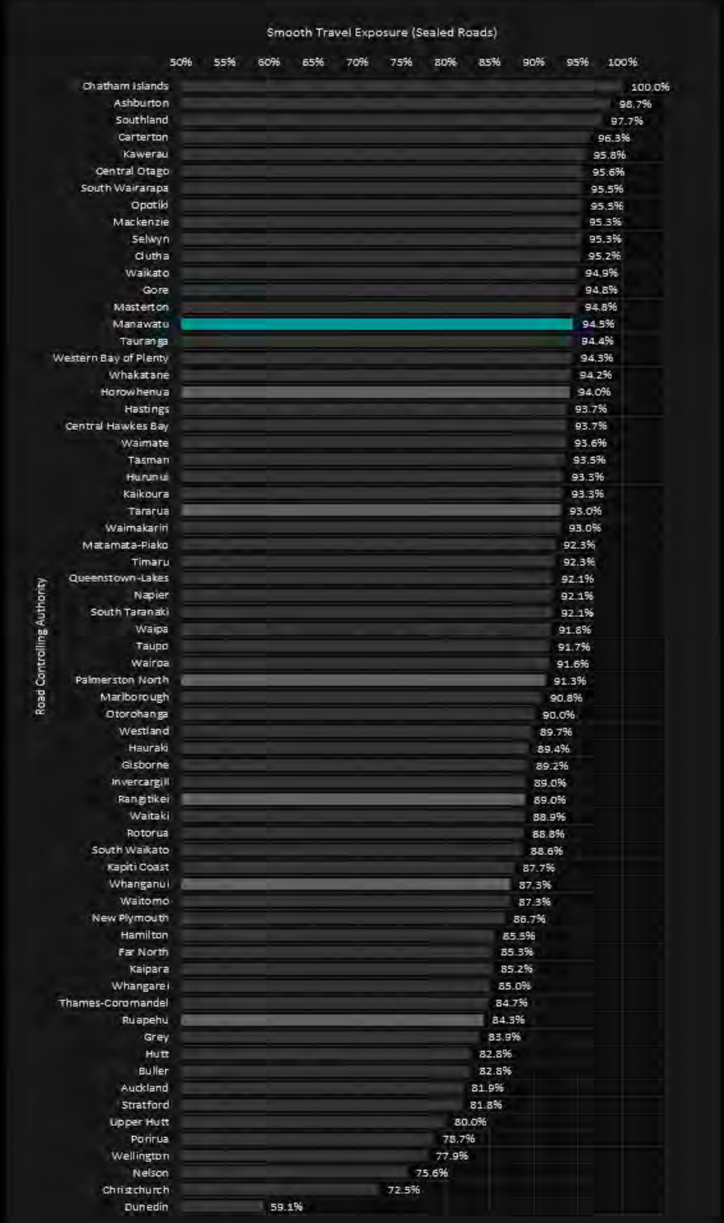


Cost comparison | by network composition

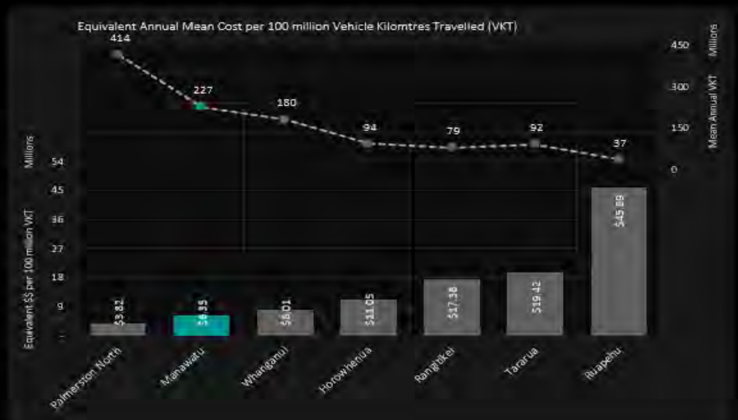


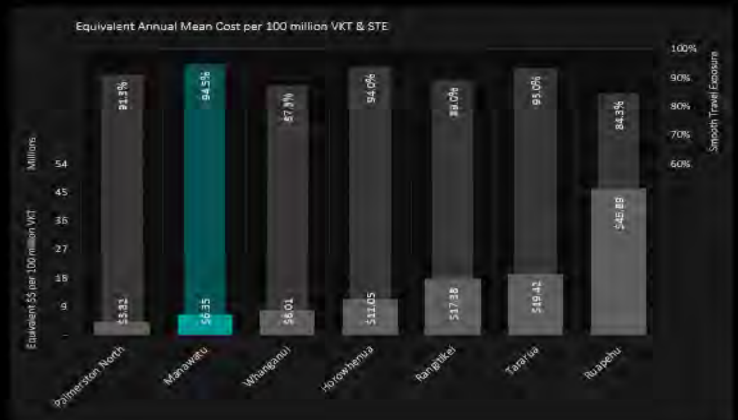


Current Smooth Travel Exposure (STE) | Local Road Controlling Authorities (RCAs)



Cost comparison | by network traffic volume





MANAWATU DISTRICT COUNCIL

It can be seen that MDC sits at – or below – the median in all activity groups (excepting structures). This is likely due to the district owning and managing an extensive, ageing bridge asset portfolio.

The analysis also shows that cost effectiveness by network length (km) and by traffic volume (VKT) reflects favourably on MDC's fiscal management and delivery (reproduced below):

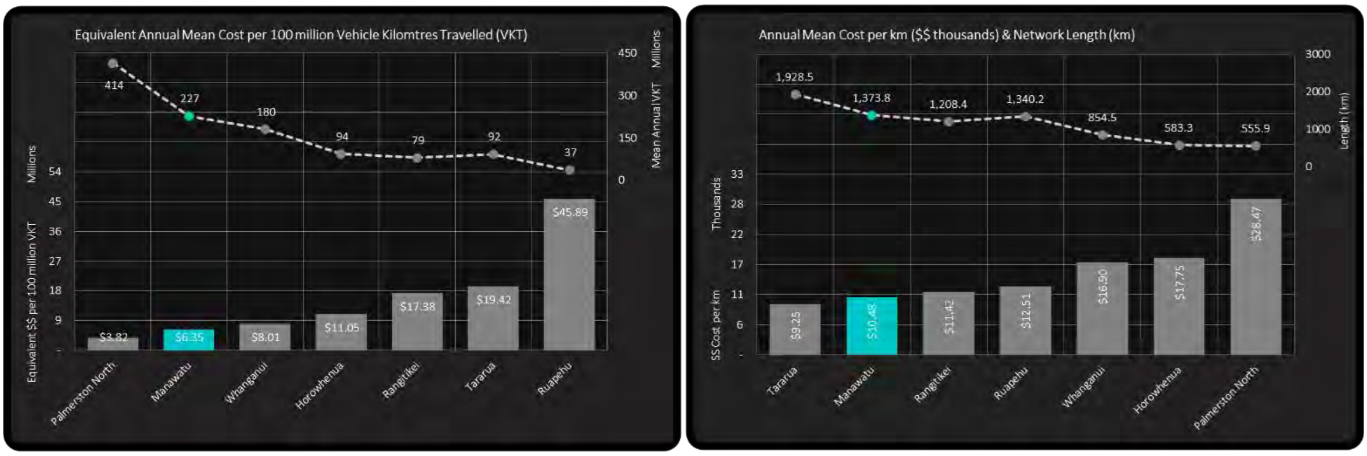


FIGURE 26: COST EFFECTIVENESS OF MDC BY KM AND VKT | REGIONAL COMPARISON

Similarly, for the '*rural districts*' peer group, the same comparison charts are produced below:

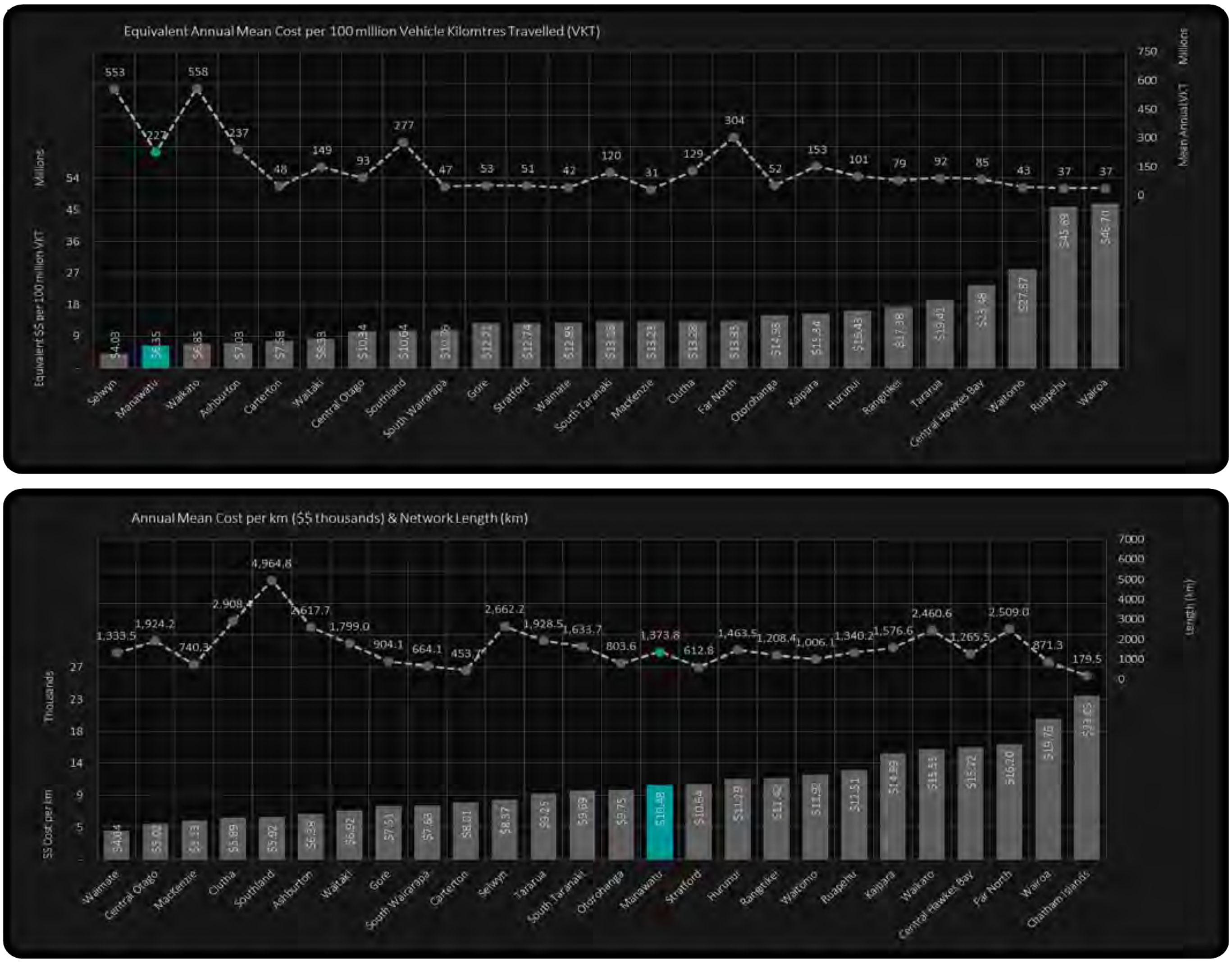


FIGURE 27: COST EFFECTIVENESS OF MDC BY KM AND VKT | '*RURAL DISTRICTS*' PEER GROUP

4.7 Summary

The overall condition trend of MDC's roads shows a gradual deterioration at current investment levels, albeit from a relatively high performance baseline. Based on current status, trends, and observed impacts, management of the existing network through the 3 main areas of drainage, environmental, and pavement/surfacing management should be the basis for Council going forward. With the recent storms and flooding across New Zealand, investment in landslip mitigation is becoming more crucial.

Pavement maintenance and renewals are generally distributed across the network, although a future focus on Low Volume, Access and Secondary Collector roads is anticipated, given the larger proportion of these classifications indicating sub-optimal performance. The pavement roughness assessment shows that only 12.4% of the network is considered to be in 'poor' condition, resulting in a network STE better than the majority of local road networks throughout New Zealand. These statistics indicate that the network is performing at an acceptable level and is being appropriately maintained. Rehabilitations are also delivering excellent value in terms of cost per km.

Resurfacing activities are also generally distributed across the network and have been delivered at a lower cost per km compared to other networks. This potentially shows that the district is achieving better value from resurfacing compared to similar networks. The slightly lower seal life achievement is being addressed and commensurate performance with other networks is an anticipated outcome.

A continuous programme of bridge and/or large culvert renewals is anticipated to commence from 2027 onwards, to ensure that a backlog of renewals does not accumulate to unsustainable levels in future. This replacement programme will prioritise condition over age, in line with best practices and recommendations.

5.0 Network demand

5.1 Context

The land transport network is required to provide safe and efficient movement of people and goods throughout the district and to neighbouring districts. Its performance directly influences the economic viability and sustainability of the district, the wider Manawatū region, and indeed the Country.

The road network was set up many decades ago and has been gradually upgraded to the present standard. However, it is quite evident that community expectations in the roading area are increasing, which requires regular reviews of levels of service and programmes for the continual improvement and development of the roading network. Generally, the network has been coping with the demands on it, but this is expected to change.

Parts of the present network will need considerable redevelopment over the next decade, and beyond, to meet community and growth expectations. The factors that will force the need for change on the assets or the management of the asset are:

Increasing population

This will result in an increase in traffic on the roads, which will increase congestion and reduce the level of service provided by the road. The additional traffic generated will increase wear on the roads, which will increase maintenance costs and reduce renewal frequencies.

Changes in the way roads are used

The creation of new urban subdivisions, or the development of new industry in one part of the district, may change how an individual road, roads, or even a sub-network will be used. This may mean roads will need to be upgraded to accommodate the changing use.

5.2 Drivers

The future demand for services will change over time in response to a wide range of influences, and factors, including:

- Location population trends
- Accuracy of predicted future populations
- Local economic trends and the diversity of industries
- Predicted traffic growth
- Changing technology
- Changing legislation requirements
- Changing community service requirements
- Specific trends that have a significant impact on the road asset
- Climate and climate change
- Land use change

All the above factors / influences impact demand and - by extension - the required development of supporting infrastructure (increasing or decreasing asset capacity to cater for forecasted demand). These factors play a role in the future transport landscape and need to be understood to generate an accurate expectation of demand, which can then be used to inform and develop reasonable infrastructure objectives. Specific demand influences within the Manawatū district are listed and briefly described below:

- **Growth** | Vehicle kilometres travelled (VKT) and HPMV impacts adding wear and tear on the network, along with increased transport due to high urban growth areas and industrial developments
- **Forestry** | Harvesting is expected to be a key driver of demand within the Manawatū district as most of the district's forest estate will reach a harvestable age between 2018 and 2030, an intensification of heavy vehicle traffic on rural roads has been experienced and continues to be expected. This intensification requires specific roads to be upgraded to handle increased demand of heavy vehicles. Due to the nature of the forestry industry, usage will highly variable and thus road usage quality during peak harvest periods will rely on proactive road maintenance schedules and effective communication between MDC asset managers, forest managers and public users
- **Dairy Conversion** | Conversion of land use to dairying is occurring with the effects already becoming evident in the Āpiti area. This conversion is producing significant heavy vehicle volumes on rural roads, putting pavement widths, loadings, and safety all under pressure
- **Agriculture** | Farming has, and is expected to continue to have, a significant impact on the district's economy. One of Council's objectives is to ensure that this industry is not adversely affected by changes in Council policy and planning requirements
- **Commercial and Industrial** | Attraction and retention of manufacturing / processing plants such as AFFCO and Venison meat packers, facilities such as ProLiant Plasma processing and nationally recognised brand commercial businesses

5.3 Forecasting

5.3.1 General traffic

Traffic counts provide the basic information to support capacity planning. Council has a comprehensive traffic count programme in place which is managed through the RAMM database.

The ONRC hierarchy for the network was last updated in 2020. This now serves as the baseline indicator of the General Traffic (GT) classification for all the district's roads. Whilst transition to the ONF is underway (and allocation of the Street Category hierarchy has already been applied, see Part A | Section 3.0), a review of the network has been undertaken for this AMP; determining where traffic volume growth has triggered a change in ONRC classification. Numerous roads have been identified where this change in classification could be applied; Table 13 highlights rural (and Table 14 urban) roads within the network:

TABLE 13: RURAL ROADS WITH GREATEST INDICATIVE TRAFFIC VOLUME GROWTH

Road	*Current ONRC*	*Indicated ONRC*	*ADT*
Banks Road	Access	Secondary Collector	441
Campion Road	Access	Secondary Collector	352
Cemetery Road	Secondary Collector	Primary Collector	690
Colyton Road	Primary Collector	Arterial	3265
Gillespies Line	Secondary Collector	Primary Collector	1379
Kaimatarau Road	Access	Secondary Collector	448

Kairanga Bunnythorpe Road	Secondary Collector	Primary Collector	698
Kimbolton Road North	Secondary Collector	Primary Collector	1049
Leen Road	Access	Secondary Collector	443
Makino Road	Secondary Collector	Primary Collector	1034
Mt Stewart/Halcombe Road	Secondary Collector	Primary Collector	1402
Newbury Line	Secondary Collector	Primary Collector	1359
Reid Line East	Access	Secondary Collector	315
Rosina Road	Access	Secondary Collector	386
Sansons road	Access	Secondary Collector	501
Taipo Road	Secondary Collector	Primary Collector	1197
Tangimoana Road	Secondary Collector	Primary Collector	618
Taonui Road	Secondary Collector	Primary Collector	1344
Waitohi Road	Access	Secondary Collector	396
Wylie Road	Secondary Collector	Primary Collector	634

TABLE 14: URBAN ROADS WITH GREATEST INDICATIVE TRAFFIC VOLUME GROWTH

Road	*Current ONRC*	*Indicated ONRC*	*ADT*
Andrew Street	Access	Secondary Collector	1472
Camden Street	Access	Secondary Collector	845
Drake Street	Low Volume	Access	256
Duke Street	Access	Secondary Collector	1197
East Street	Primary Collector	Arterial	7102
Fergusson Street	Secondary Collector	Primary Collector	1909
Haybittle Street	Access	Secondary Collector	324
Hobson Street South	Access	Secondary Collector	902
Hunia Terrace	Access	Secondary Collector	375
Koputara Road	Secondary Collector	Primary Collector	1280
McDonald Heights	Low Volume	Access	260
Mahinui Street	Secondary Collector	Primary Collector	607
Marlborough Street	Access	Secondary Collector	1099
Nancy Avenue	Access	Secondary Collector	816
Nelson Street	Low Volume	Secondary Collector	516
Phillips Street	Low Volume	Secondary Collector	498
Port Street East	Low Volume	Access	290
Punga Street	Low Volume	Secondary Collector	512
Ruawai road	Low Volume	Access	301
Sherwill Street East	Access	Secondary Collector	810
Sherwill Street West	Access	Secondary Collector	677
Thames Street	Secondary Collector	Primary Collector	1798
Turners Road	Secondary Collector	Primary Collector	1832
Wapiti Avenue	Low Volume	Access	320

The network - as a whole - has seen traffic volumes increase from 221 million VKT to 231 million VKT between 2020 and 2022, averaging 1.5% growth per annum. There is, however, an appreciable difference in growth between the urban and rural portions of the network:

- Urban traffic volume growth between 2020 and 2022 has averaged 1.2% per annum
- Rural traffic volume growth between 2020 and 2022 has averaged 1.6% per annum

Some individual roads and routes in the district may experience a higher growth rate due to increased localised residential or commercial development. The main arterial and collector roads connecting Feilding to Palmerston North may also have increasing demand placed on them; to cater for those who wish to live outside the main metropolitan area of Palmerston North but still rely on daily trips to the city for work and other requirements.

Overall, traffic volumes are expected to continue along these trajectories (for rural and urban areas) for the foreseeable future, taking into account the quantity and location of residential and commercial growth within the district. The predicted traffic growth for the district is typical for a rural roading network and is generally in line with growth rates at a regional level.

5.3.2 Industrial and commercial activity

While looking at current traffic demand, it is also important to understand where future funding may be required.

Manawatū is known for its forestry activities which was established in the 1990's. Large-scale harvesting of this resource commenced in 2018-19, with initial predictions [18] showing a peak between 2024 and 2029. Since the initial prediction profile (see in Figure 28), tonnage extraction was seen to increase rapidly in 2019 (primarily from sites not expected to be harvested until the 2027-30 block). This acceleration was due to highly favourable markets, redefining the boundaries of profitability for timber suppliers.

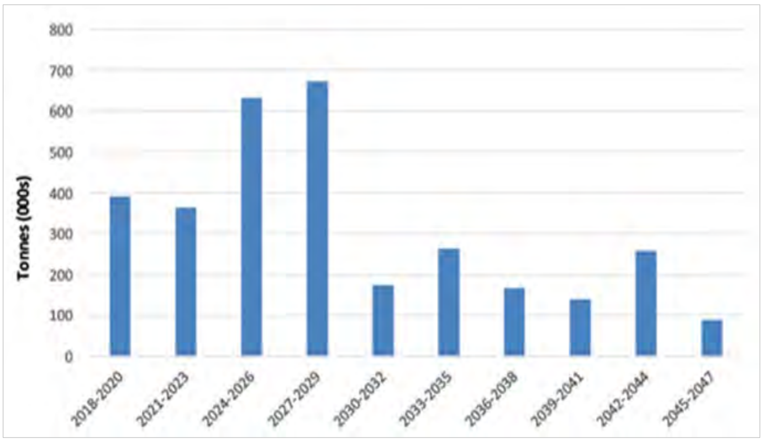


FIGURE 28: FORECAST WOOD SUPPLY FOR THE MANAWATŪ DISTRICT 2018-47

Between 2020 and 2021, a hiatus in logging activity throughout New Zealand was observed; the result of global efforts to prevent a pandemic viral event from taking hold (namely the Coronavirus, or Covid-19). Logging operations have since resumed along the anticipated trajectory, trending towards the originally predicted levels in 2030.

To date, the impact of logging trucks has been constrained to a small number of routes servicing larger scale harvest operations; significant deterioration has been observed to affected pavements and reacted to in an ongoing manner. These reactive works have had moderate success in managing the impact so far.

The graphs below show the updated, predicted extraction tonnage and cumulative percentage of harvested yield by 3-year block (including the preceding 3-year period). The original prediction that 66% of all tonnage will be extracted by 2029-30 stands:

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[18] *'Wood availability and related roading implications on Manawatū District roads 2018-2047; A forecast study prepared for MDC'* (Moore and Associates, February 2017)

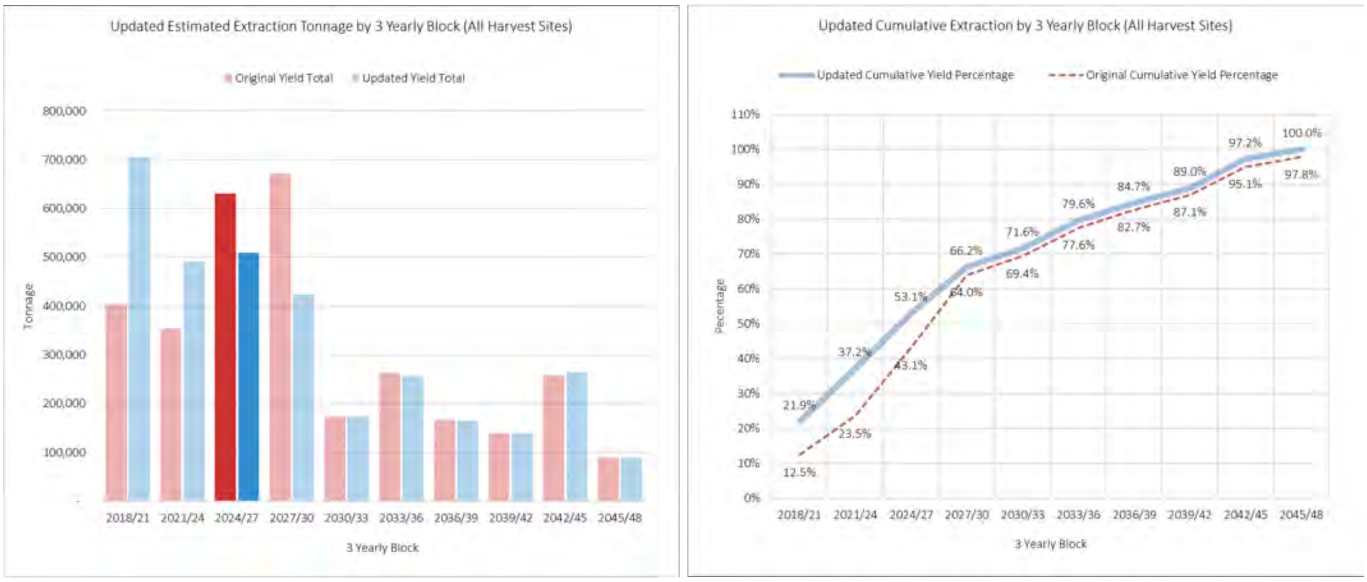
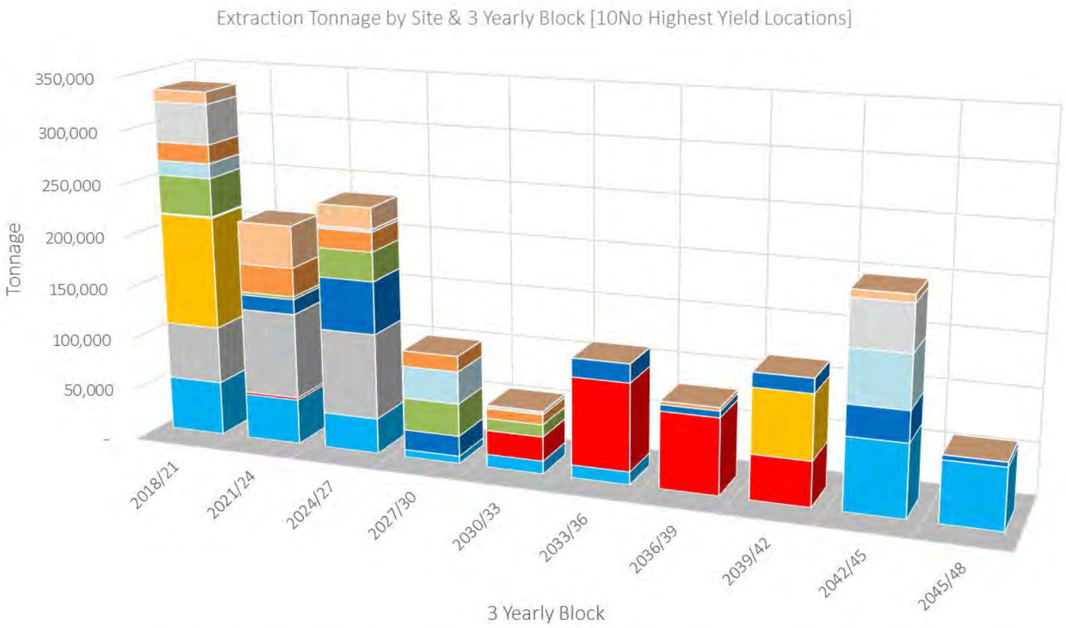


FIGURE 29: REALIGNED (ESTIMATED) TONNAGE EXTRACTION FOR MDC

Figure 30 shows the top 10 harvest sites by yield (from a total of 114 identified harvest sites), amounting to 50% of overall tonnage predicted for extraction within the Manawatū district:



	2018/21	2021/24	2024/27	2027/30	2030/33	2033/36	2036/39	2039/42	2042/45	2045/48
Rangitikei Valley Road	11,713	40,492	20,458	-	-	-	-	-	7,314	-
Koputara Road	38,425	-	2,703	-	2,968	-	-	-	44,202	-
Himatangi Beach Road	17,861	27,666	18,656	14,840	9,646	-	3,074	-	-	-
Tangimoana Beach Road	14,045	-	-	31,058	-	-	-	-	50,297	-
Cheltenham-Hunterville Road	36,941	2,756	28,090	31,270	11,713	-	-	-	-	-
Tangimoana Road	1,113	14,575	50,933	19,663	-	17,861	6,201	13,939	29,256	4,558
Ridge Road	108,014	-	-	-	-	-	-	61,533	-	-
Waipuru Road	54,908	82,362	82,362	-	-	-	-	-	-	-
East Mangahuia Rd (Bowling Rd)	-	2,279	-	-	23,320	83,952	73,140	42,877	-	-
Lake Road	51,993	43,407	34,026	6,996	12,349	12,190	-	-	69,271	57,982

FIGURE 30: EXTRACTION TONNAGE BY SITE AND PERIOD (10NO HIGHEST YIELD SITES)

These harvest sites all have routes associated with the movement of forestry products between Manawatū and the rest of the country, detailed in Table 15 below.

Council has anticipated expected harvest timeframes and access points/haul routes from both the '*Moore & Associates*' report and corridor access requests / associated traffic management plans being submitted to the Corridor Access Co-ordinator. Below highlights the current anticipated tonnages and potential haul roads for the 2024-27 period from the 10 highest yield sites:

TABLE 15: POTENTIAL LOCAL NETWORK HAUL ROADS FOR THE 10 HIGHEST YIELD HARVEST SITES

Yield Site	*Tonnage 2024-27*	*Roads*	*Classification*
Lake Road	34,036	Lake Road	Access
East Mangahuia Road	-	East Mangahuia Road (Bowling Rd)	Low Volume
		Main South Road	Low Volume
		Te Parapara Road	Access
		Ruahine Road	Secondary Collector
Waipuru Road	82,362	Waipuru Road	Low Volume
		Sandon Block Road	Access
Ridge Road	-	Ridge Road	Low Volume
		Finnis Road [Rural]	Low Volume
		Taonui Road	Secondary Collector
		Colyton Road	Primary Collector
Tangimoana Road	50,933	Tangimoana Road	Secondary Collector
Tangimoana Beach Road	-	Tangimoana Beach Road	Secondary Collector
		Tangimoana Road	Secondary Collector
Hīmatangi Beach Road	18,656	Hīmatangi Beach Road	Primary Collector
Koputara Road	2,703	Koputara Road	Secondary Collector
		Hīmatangi Beach Road	Primary Collector
Rangitikei Valley Road	20,458	Rangitikei Valley Road	Access

The future demands on these specific low volume, access and secondary collector roads are expected to be moderately high, with historic data showing an already increased demand on these road types. Maintaining cognisance of upcoming demands on the network is recommended to address any existing defects and reduce future reactive maintenance.

5.3.3 Demographics and funding

Generating a demand forecast to inform future infrastructure investment decisions carries some inherent risk due to the significant assumptions that need to be made. Scenario testing assumptions and the alternative outcomes are listed below together with their relative risk to planned future investment.

TABLE 16: DEMAND FORECASTING

Assumption	*Population of the district will increase from 34,000 residents in 2024 to 42,000 in 2054*		*Population distribution across the district will occur forecasted*	*The number of households will increase from 13,000 in 2024 to 18,000 by 2054*		*The number of residents aged 65 and over will increase from 6,900 in 2024 to 10,500 by 2054*		*The demographics of the Manawatū district will follow the Info metrics medium growth scenario over the period 2024 to 2054*
Alternative	Population will increase more rapidly than forecasted	Population will increase more slowly than forecasted	Population will differ substantially from forecasted distribution	Number of households will increase faster than forecasted	Number of households will increase slower than forecasted	The number of residents aged 65 years and over will be significantly more than forecasted	The number of residents aged 65 years and over will be significantly less than forecasted	The demographics of the Manawatū District will differ significantly from the Info metrics medium growth scenario
Impact	Moderate (2)	Minor (1)	Moderate (2)	Major (4)	Minor (1)	Moderate (2)	Minor (1)	Minor (1)
Likelihood	Possible (3)	Possible (3)	Possible (3)	Possible (3)	Possible (3)	Unlikely (2)	Unlikely (2)	Possible (3)
Overall Risk	Guarded (6)	Guarded (3)	Guarded (6)	Moderate (12)	Guarded (3)	Guarded (4)	Low (2)	Guarded (3)

Assumption	Current land uses will not change significantly over the next 3 years. However, significant land use changes are expected between 2034 and 2054		Intensity and frequency of extreme weather events will increase because of climate change		Council will receive 51% of the cost of roading maintenance and renewal projects from NZTA each financial year from 2024.	Council will receive funding from NZTA for the maintenance and renewal of roads.		The district council is prepared to respond to emergency events over the life of the 10-year plan, however a catastrophic event will exceed council's provisions to respond
Alternative	Current land use in the district will change more rapidly, or in different locations than anticipated	Current land use in the district will persist / develop slower than anticipated	Extreme weather events are more intense and frequent	Extreme weather events are less intense and frequent	The total level of NZTA funding for maintenance and renewal of roads is reduced	Roading maintenance and renewal projects will not secure NZTA funding	That there are delays in finalising NZTA funding, impacting council's delivery of projects	An emergency event occurs that exceeds councils' financial ability to respond
Impact	Moderate (2)	Minor (1)	Severe (8)	Minor (1)	Severe (8)	Severe (8)	Major (4)	Worst Case (16)
Likelihood	Likely (4)	Unlikely (2)	Likely (4)	Unlikely (2)	Possible (3)	Unlikely (2)	Possible (3)	Possible (3)
Overall Risk	Moderate (8)	Low (2)	Extreme (32)	Low (2)	High (24)	High (16)	Moderate (12)	Extreme (48)

5.4 Management

The demand management plan considers a range of items that impact ongoing operations of the network and how to manage these risks to ensure the network does not become overloaded with a declining level of service.

Supply side demand management plan | Outline Development Plans (ODPs) have been developed for inclusion into the District Plan as part of the plan change process. These seek from the outset to achieve good urban design and sustainable outcomes by establishing how each block will spatially develop across all infrastructural assets, and how these developments will link to existing and other new areas.

Minor Improvements | The funding of improvements is catered for in the subsidised NLTP under Activity Class: Local Road Improvements, allocated under NZTA Work Categories 216, 322 to 325, 341, and 357. Individual projects must meet assessment criteria under NZTA's Investment Decision-Making Framework (IDMF) to be eligible for funding.

New Improvements Planning | The Council operates a Projects Database that lists potential individual improvement projects from sources such as township committees or community boards, staff and councillors.

Local Priorities | As part of the development of LTP, the District's communities, via their respective Community Committees, are provided the opportunity to rank proposed improvement projects in order of their preferences. These preferences are then considered by the Council in the preparation of the LTP and Annual Budgets. A Hazard and Deficiency Database is used to evaluate and rank projects based on a risk reduction, traffic and cost basis.

Subdivision Commitments | Subdivision commitments can only be determined on a case-by-case basis once applications are lodged and approved. Consent conditions, under the Resource Management Act 1991, requiring financial contributions for roading upgrades conditions can be contested by the developer.

Development Contributions | Development contributions are contributions required from developers to help offset the effects of growth they have induced on the network. They are levied under the LGA 2002 and Council's Development Contribution Policy. Financial Contributions are levied for specific works that need to be carried out on roads adjacent to new developments. The costs of these works are shared with the Council, based on projected traffic volumes.

Subdivision Approvals and Commitments | If the zoning status of land changes, through the Manawatū District Plan or private plan changes, this can result in areas being subdivided and developed for residential, rural residential, business/commercial and industrial purposes. This can drive the requirement for existing roads and streets to be upgraded and new infrastructure to be constructed and vested in the Council. Developers usually pay the full cost of roading and development works within new subdivisions.

Subdivision Development | Developers pay the full cost of development within new subdivisions, with new assets being vested to Council upon completion and the issuing of subdivision titles. However, on-going maintenance and renewal of the new roads and associated assets built in these developments is the responsibility of the Council. The policy for development contributions that may be charged for future subdivisions is established at a Council wide level, as provided for under the LGA 2002 and Development Contribution Policy.

5.5 Summary

The main challenges facing the roading network are not just related to traffic growth since there is spare capacity to cater for additional traffic flows at present. The challenges relate more to:

- A legacy transportation network not envisaged to accommodate the demands of heavy traffic
- The impact of exotic forestry harvesting on remote rural roads
- Long term funding from NZTA for the current budgeted proportion of maintenance and renewal costs
- Network Frameworks introduced by NZTA have resulted in changes to levels of service
- Development of an enduring bridge renewal programme
- Delayed Emergency Funding from NZTA

Demand for new or upgraded facilities arises from the needs of the existing population i.e., meeting the level of service standards, changing habits, and population growth. This may cause demand for:

- New roads
- Sealing of unsealed roads
- Widening and alignment improvements
- Upgraded intersections
- New and upgraded bridges
- Appropriate urban facilities in closely settled areas, e.g., streetlights, kerb and channel, footpaths

The Council intends to maintain its awareness of these issues and plans to provide a roading network which meets the communities' expectations. This may involve more seal extension, better ways to provide and maintain unsealed roads, and possible widening of some arterial and collector level roads in the district.

6.0 Network issues

6.1 Key performance indicators and measures

Throughout all stages of the transport planning and project delivery process, it is essential to consider how performance will be measured. In particular, under the business case approach, early identification of measures for the expected benefits is a key step in planning an investment.

The following benefits and their Key Performance Indicators (KPI's) have been identified in Table 17 below to demonstrate how the outcomes from strategic response(s) to the problems are to be assessed:

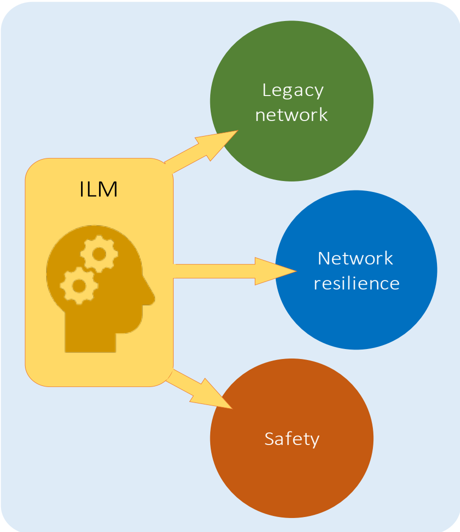
TABLE 17 - IDENTIFIED BENEFITS AND KEY PERFORMANCE INDICATORS

Benefit	*Investment KPI & Outcome Measures*	*Description of successful outcome(s)*
Efficient Network	KPI 1: Constant maintenance costs	Delivers optimised programmes that are affordable and improves service productivity.
	KPI 2: Improve/Maintain Road condition	Manages the impact of activities and demand on the network.
Resilient Network	KPI 1: Reduce Emergency Work and Costs	Protects the network from damage and minimises road closures, resulting in reduced Emergency Work costs.
	KPI 2: Maintain network accessibility	Delivers reduced disruption to access on the network
	KPI 3: Travel Time Reliability	Manages the impact of activities and demand on the network.
Safe Network	KPI 1: Serious & Fatal crashes	Reduces Serious & Fatal crash events on the network
	KPI 2: Collective Risk	Reduces Collective Risk
	KPI 3: Personal Risk	Reduces Personal Risk
Enable Growth	KPI 1: Growth opportunities	Enable population growth
	KPI 2: Uptake of industrial land	Enable Building and Resource Consent Applications

6.2 Investment logic mapping

Using the NZTA recommended Investment Logic Mapping (ILM) framework, the following, updated issues were discussed and agreed by Council in 2022.

Based on the evidence, the issues identified fall under three key themes: Legacy Network, Resilience, and Safety:



Deteriorating condition and changing demands on Access, Low Volume and Secondary Collector roads are resulting in decreased Levels of Service and increasing reactive interventions

The Manawatū District is susceptible to increasingly severe climatic events resulting in significant reactive maintenance expenditure, disruption to the network and increased road safety risks

Given the level of Fatal and Serious crashes in the last 5 years, investment is required to achieve the 'Road 2 Zero' target of 'a 40% reduction on 2018 Fatal & Serious crashes'

These problems have been assessed against benefits and objectives with their relative importance weighting:

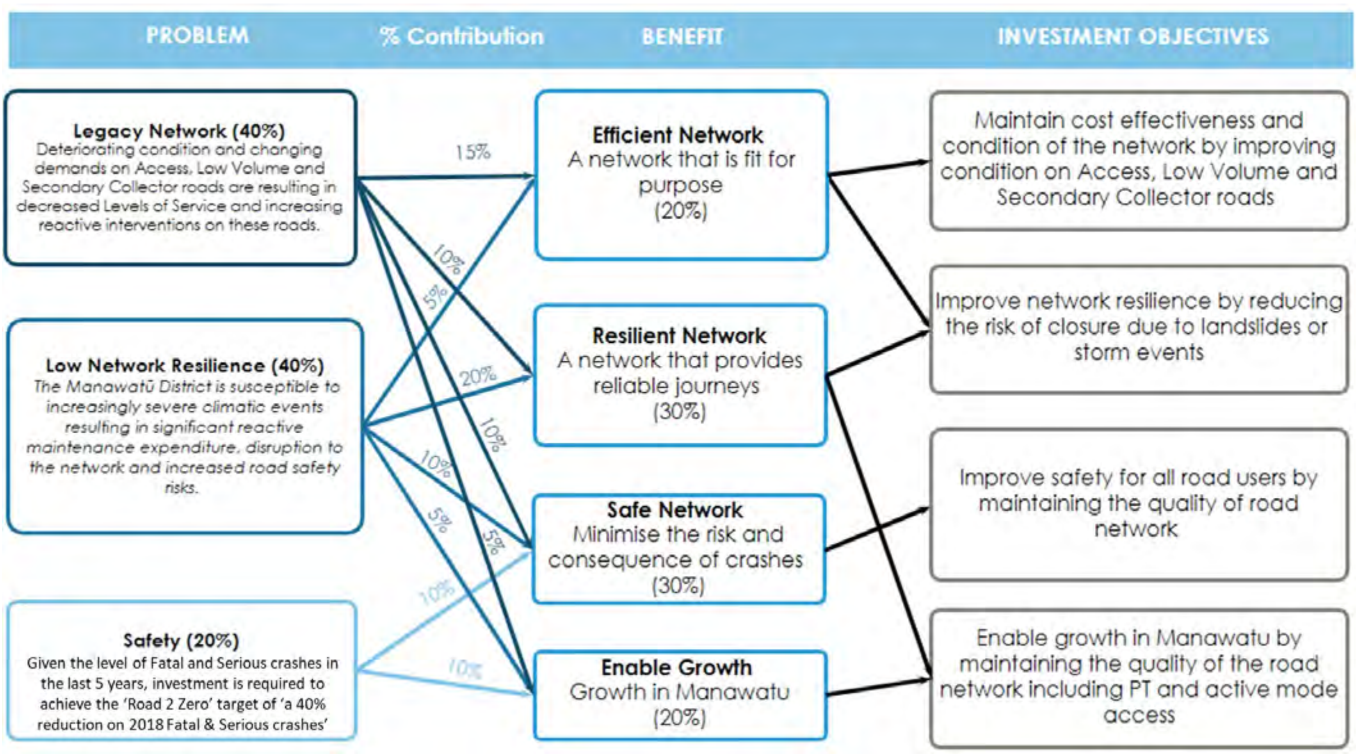


FIGURE 31: INVESTMENT LOGIC MAP

6.3 Issue 1 | Legacy network

Deteriorating condition and changing demands on Access, Low Volume and Secondary Collector roads are resulting in decreased Levels of Service and increasing reactive interventions

6.3.1 Maintenance cost trend

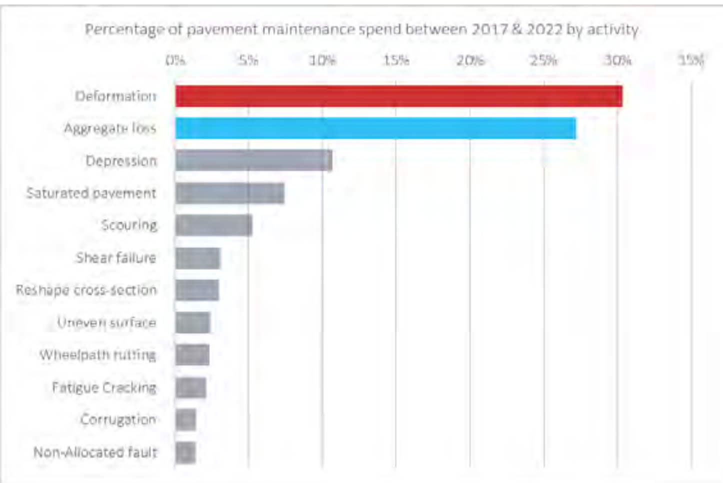


FIGURE 32: PAVEMENT MAINTENANCE SPEND BY ACTIVITY 2017-22

Apportionment of pavement maintenance costs over a 5-year period between 2017 and 2022 can be seen in Figure 32, broken down by defect type (*note: activities with <1% spend omitted from chart for clarity*).

Maintenance spend has focused primarily on deformation and aggregate loss defect mitigation, accounting for almost 58% of expenditure. The data also shows that spend on pavements has decreased over the time (see Figure 33 below); this is likely as a result of 2 factors. Firstly, higher expenditure from 2017 to 2020 was an immediate reaction to the start of intensive forestry activity and secondly, expenditure on environmental management activities has been prioritised as a result of numerous adverse weather events in recent years.

Deformations are usually associated with localised pavement strength issues to sealed pavements, while aggregate loss is associated with unsealed roads. Whilst anticipated haul routes currently operate at an acceptable level, routine maintenance along these routes will ensure that the road performance does not deteriorate as a result of forestry harvesting.

FIGURE 33: COST TREND | DEFORMATION AND AGGREGATE LOSS

6.3.2 Sealed roads | Deformation cost and pavement performance trend

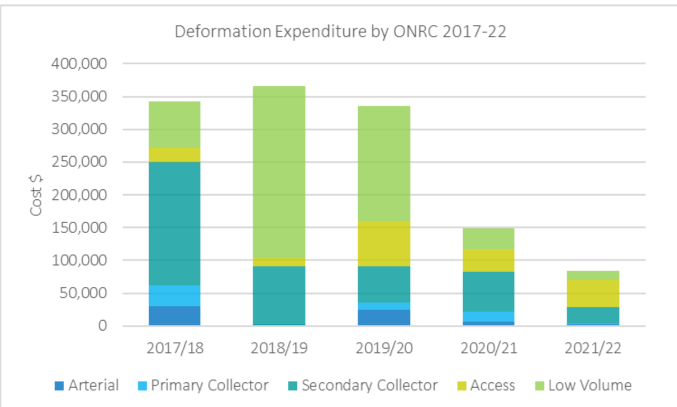


FIGURE 34: DEFORMATION COST BY ONRC 2017-22

Analysis of deformation costs by ONRC further revealed that activities on Access, Low Volume and Secondary Collector Roads account for 90% of spend between 2017/18 and 2021/22, mirroring the roads used as forestry haul routes.

As a consequence, Pavement Integrity and Smooth Travel Exposure measures both show decreasing trends over the same period.

Figure 35 below highlights these trends with a linear projection of performance, if the current quantum of maintenance remains at similar levels:

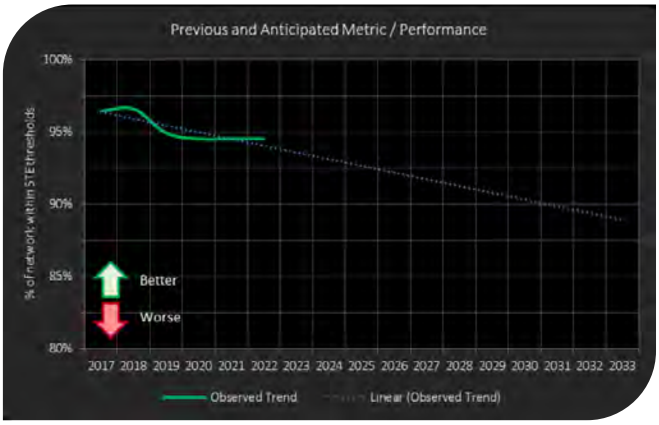


FIGURE 35: TREND OF PAVEMENT INTEGRITY INDEX (PII, LEFT CHART) AND SMOOTH TRAVEL EXPOSURE (STE, RIGHT CHART) AS A CONSEQUENCE OF RECENT INVESTMENT LEVEL

Table 18 below summarises the current pavement condition for roads servicing the top 3 high yield harvesting sites during the 2024-27 period. Data shows that these routes currently enjoy a high percentage of total length in acceptable condition. A focus on maintenance to these roads (particularly Tangimoana Road) will be required to ensure their condition remains adequate.

TABLE 18: ANTICIPATED 2024-27 FORESTRY ROUTES | CURRENT CONDITION

LWP Maximum Rutting Depth for Road Lengths on Route

Classification	Roads	Good	Acceptable	Fair	Poor	Very Poor
Access	Lake Road	50%	42%	5%	3%	1%
Secondary Collector	Tangimoana Road	42%	29%	19%	6%	4%
Primary Collector	Hīmatangi Beach Road	60%	30%	8%	1%	1%

NAASRA Roughness for Road Lengths on Route

Classification	Roads	Good	Acceptable	Fair	Poor	Very Poor
Access	Lake Road	28%	62%	5%	2%	2%
Secondary Collector	Tangimoana Road	71%	20%	4%	3%	1%
Primary Collector	Hīmatangi Beach Road	75%	17%	5%	2%	1%

This clearly highlights that specific roads continue to be impacted by external forces and require ongoing focus. Table 19 shows the roads likely to require maintenance/renewal interventions i.e., those with pavement condition concerns which have been subjected to forestry haulage or high spend on deformation remediation.

TABLE 19: PRE OR POST FORESTRY ROAD RENEWAL SITES OR WITH HIGH DEFORMATION COSTS

Roads	*High Yield Forestry Demand*	*Proactive/Reactive*
Tangimoana Road	Expected 2024-25	Reactive
Pōhangina Road	Expected 2027-30	Proactive
Pōhangina Valley East Road	*Not applicable*	*n/a*
Taonui Road	Expected 2039-42	Proactive

6.3.3 Unsealed roads | Aggregate loss cost and performance trend

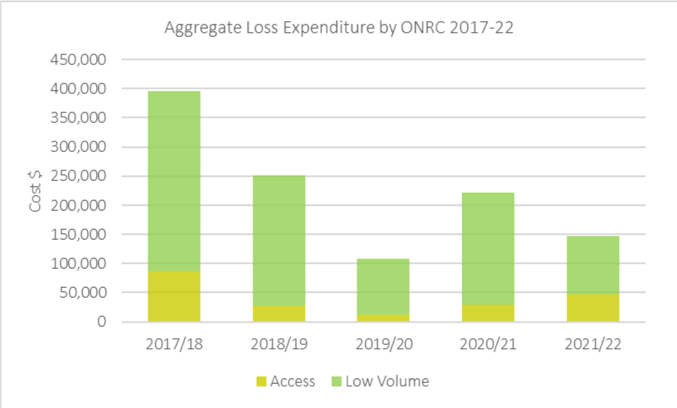


FIGURE 36: AGGREGATE LOSS COST 2017-22

A similar analysis of aggregate loss by ONRC to that for sealed roads shows that aggregate loss primarily occurs to Low Volume roads. This is to be expected given the majority of unsealed roads falling under this classification.

Unsealed roads are not assessed in the same manner as sealed roads, and management is monitored primarily through customer satisfaction and frequent visual inspections. Council has reviewed customer requests for service relating to unsealed road performance over the last 5 years and plotted the trends, split by renewal or maintenance. Figure 35 below highlight these trends with a linear projection of performance, if quantity of maintenance remains at similar levels:

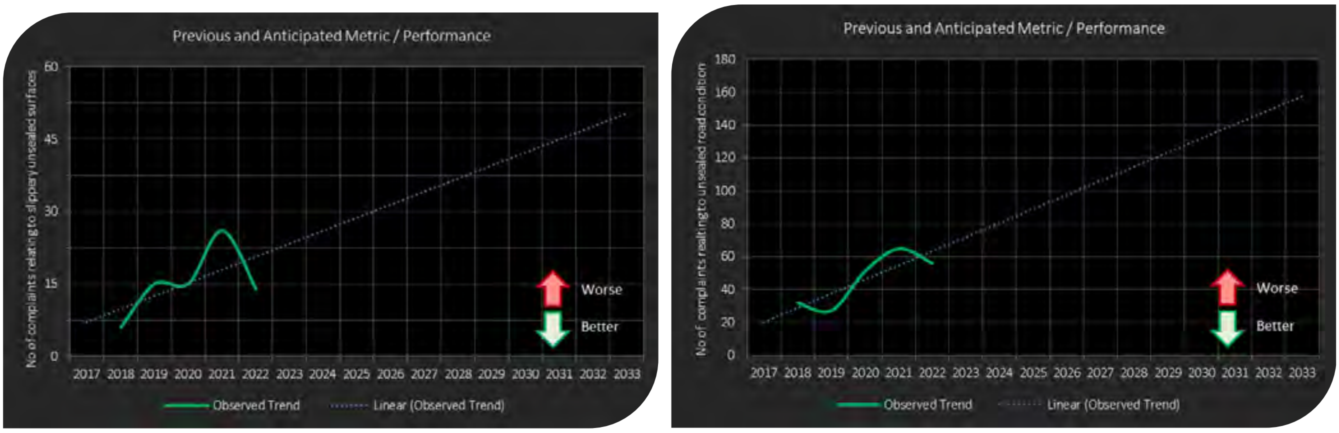


FIGURE 37: TREND OF CUSTOMER INTERACTIONS FOR SLIPPERY SURFACES (LEFT CHART) AND GRADING/SCOUR/CORRUGATIONS (RIGHT CHART) AS A RESULT OF RECENT INVESTMENT LEVEL

The number of complaints / requests received per annum are primarily related to:

a. lack of stone chip (metal) as a running course to unsealed pavements, resulting in slippery pavement conditions, and

b. scour or corrugations to surface, creating a rougher ride for road users

Lack of metal is addressed through *Work Category 211: Unsealed Road Metalling*, whilst surface defects are addressed through *Work Category 112: Unsealed Road Maintenance*.

The increase in customer interactions regarding unsealed road condition is primarily as a result of:

a. ongoing logging operations, and

b. frequent adverse weather events

impacting on both the quality of ride and rapidity at which deterioration occurs; this can be mitigated through an increase in grading activities and quantity of metal supplied. In addition, maintaining cognisance of upcoming logging operations is considered a prudent measure; this will result in customers being informed and prepared for the impacts, and will go some way to managing expectations of unsealed road performance.

The distribution of this expenditure across the network is shown in Figure 38; the thicker/darker the line, the higher the spend. Areas where greater spend is evident align with the 2 factors highlighted earlier (logging and adverse weather):

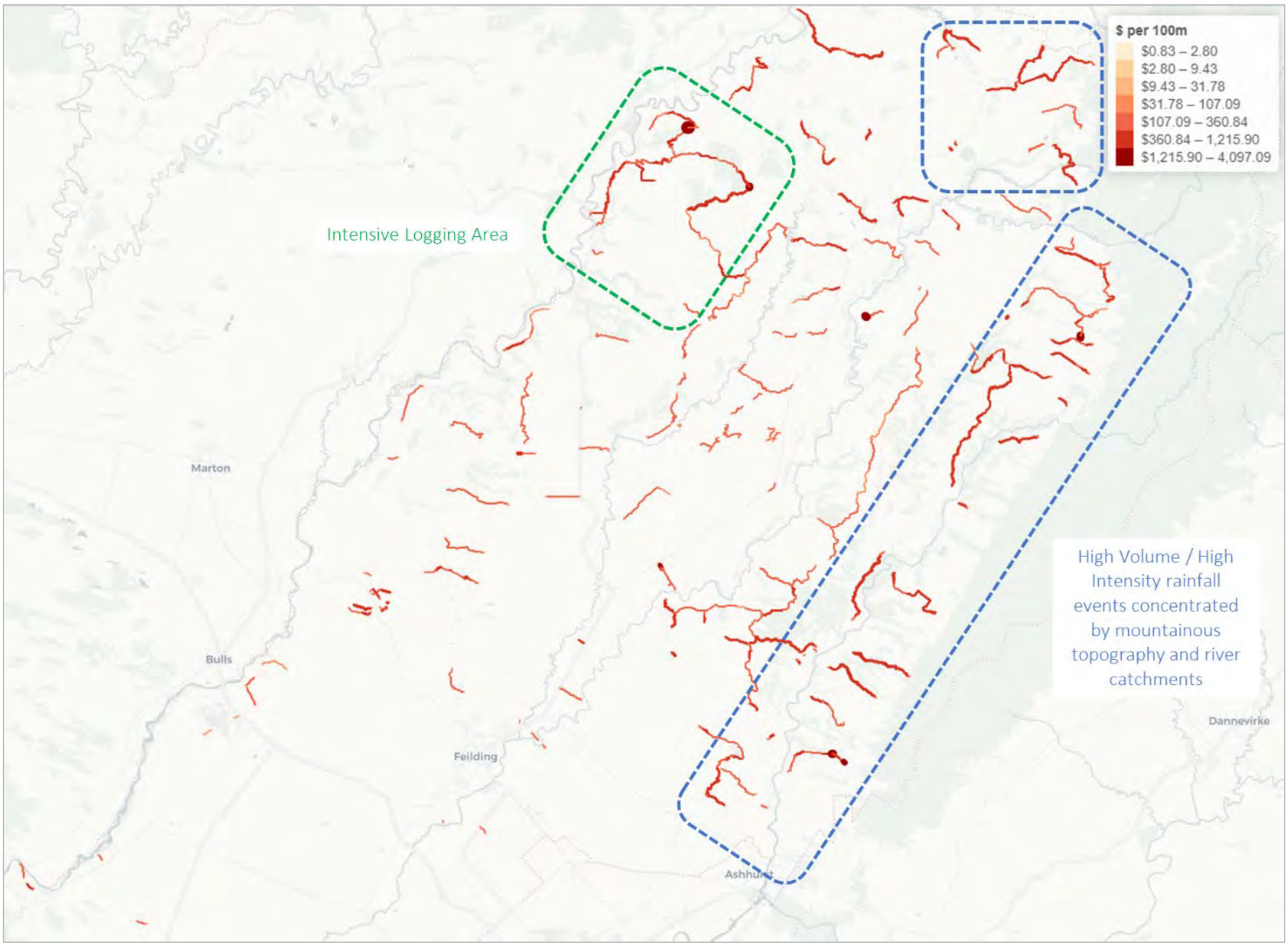


FIGURE 38: LOCATION OF SPEND ON AGGREGATE LOSS ACROSS THE NETWORK 2017-22

In addition, these routes have been checked against the maintenance spend over the past 5 years. The data shows that the roads in Table 20 have had historic high spend on aggregate loss with anticipated future spend as a result of forestry haulage; continued investment is required to manage these roads efficiently.

TABLE 20: PRE OR POST FORESTRY ROAD RENEWAL SITES OR WITH HIGH SPEND ON AGGREGATE LOSS

Roads	*High Yield Forestry Demand*	*Active*	*Proactive/Reactive*
Waipuru Road	Expected 2024-27	Yes	Reactive
Mangapapa Road	Expected 2024-27	Yes	Reactive
Sandon Block Road	Expected 2024-27	Yes	Reactive
Finnis Road [Rural]	Expected 2039-42	No	Proactive
Pōhangina Road	*Not applicable*	*n/a*	*n/a*

6.3.4 Investment benefits

MDC's road network connects business with customers, suppliers and the workforce, helps people access places of employment and education, and helps move goods from point of production to local, national, and international markets. There is no single indicator of how roads contribute to economic and social outcomes, however Council considers that the local road network delivers on the priorities defined in the GPS 2024. In addition, this investment will align with achieving the mobility and accessibility level of service criteria.

6.3.5 Consequence of reduced investment

Overall, the road network is in good condition with some sections of Access, Low Volume and Secondary Collector roads performing at a sub-optimal level.

Ongoing road maintenance is essential in order to preserve the road asset, protect user safety, and provide efficient and convenient travel along the route. If maintenance and renewals are neglected or improperly performed there will be a deterioration of the road and eventual failure from both climatic and vehicle use impacts.

Roads identified as requiring sealed pavement renewal treatment(s) are included in the Table 21.

TABLE 21 : ROADS IDENTIFIED FOR FUTURE INVESTMENT

Road Classification	*Roads*	*Roughness Treatment*	*Rutting Treatment*
Low Volume	Mangamako Road	Y	
Low Volume	Mangawhata Road	Y	
Access	Otara Road	Y	
Access	Ruahine Road	Y	
Secondary Collector	Mt Stewart-Halcombe Road		Y
Secondary Collector	Short Road		Y
Secondary Collector	Taonui Road	Y	Y
Secondary Collector	Pohangina Valley East Road	Y	Y
Secondary Collector	Tangimoana Road	Y	Y
Secondary Collector	Hoihere Road	Y	
Primary Collector	Pohangina Road	Y	Y

If the investment were reduced, the result would be a more patched and rougher network. With Low Volume, Access, and Secondary Collector road classifications making up a significant majority of the network, decreasing performance would likely attract increased complaints from the community and receive negative media coverage.

6.3.6 Strategic response

The strategic response will require a combination of interventions, including:

Non-fiscal

- Communicate to the public the maintenance strategy and what the likely benefits and consequences may be
- Communicate with forest owners and logging contractors to discuss solutions such as agreements on harvest programmes and 'fit for purpose' maintenance regimes

Fiscal (subsidised intervention activities)

- Improve: the reliability and cost effectiveness of the road network
- Deliver: Optimised programmes that are affordable and consistent in cost within like classifications

The flow chart in Figure 39 below describes the mix of interventions, based on pavement performance and likely usage affecting portion(s) of the network:

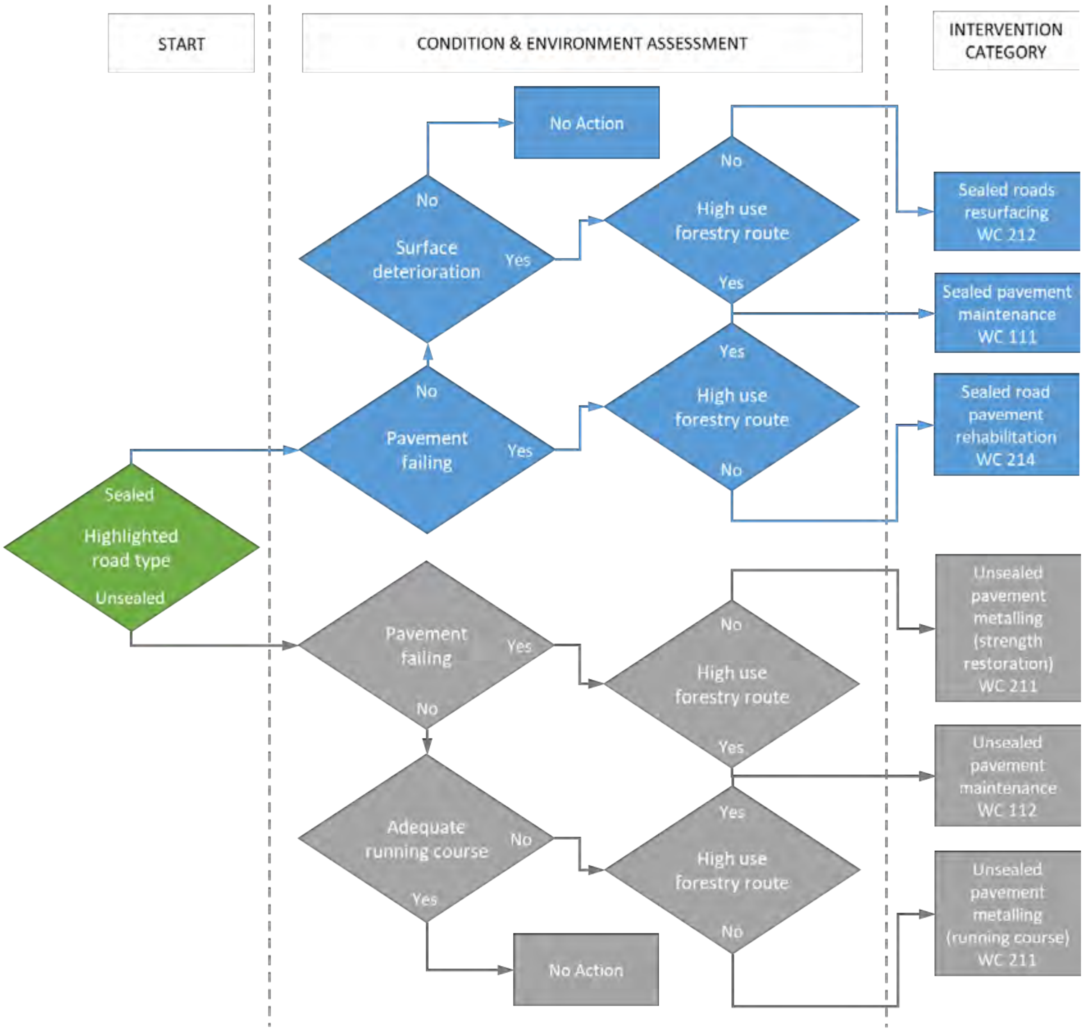


FIGURE 39: INTERVENTION WORKFLOW, MANAGEMENT OF PAVEMENT AND SURFACES

TABLE 22: STRATEGIC RESPONSE, ISSUE 1

Issue	*Findings / Status*	*Strategic Response*	*Priority*	*Focus*
Legacy network	Forest harvest schedules are expected to be most intense in the period 2018-2030 with the majority of the district's forest estate reaching harvestable age 66% (2,130,000 tonnes) of the district's total expected yield will be extracted by 2030	Engage with logging companies to manage route demand, minimise nuisance and mitigate pavement damage	HIGH	40%
		Continue pavement repairs to mitigate deterioration during high forestry activity	MEDIUM	
		Plan rehabilitation of pavements prior to starting - or coinciding with completion of - high forestry route use	MEDIUM	
		Plan surfacing treatments around periods of high forestry use	MEDIUM	

6.4 Issue 2 | Network resilience

The Manawatū District is susceptible to increasingly severe climatic events resulting in significant reactive maintenance expenditure, disruption to the network and increased road safety risks

6.4.1 Climate change

Figure 40 shows the primary climate change impacts for the Nation and Manawatū (inset).

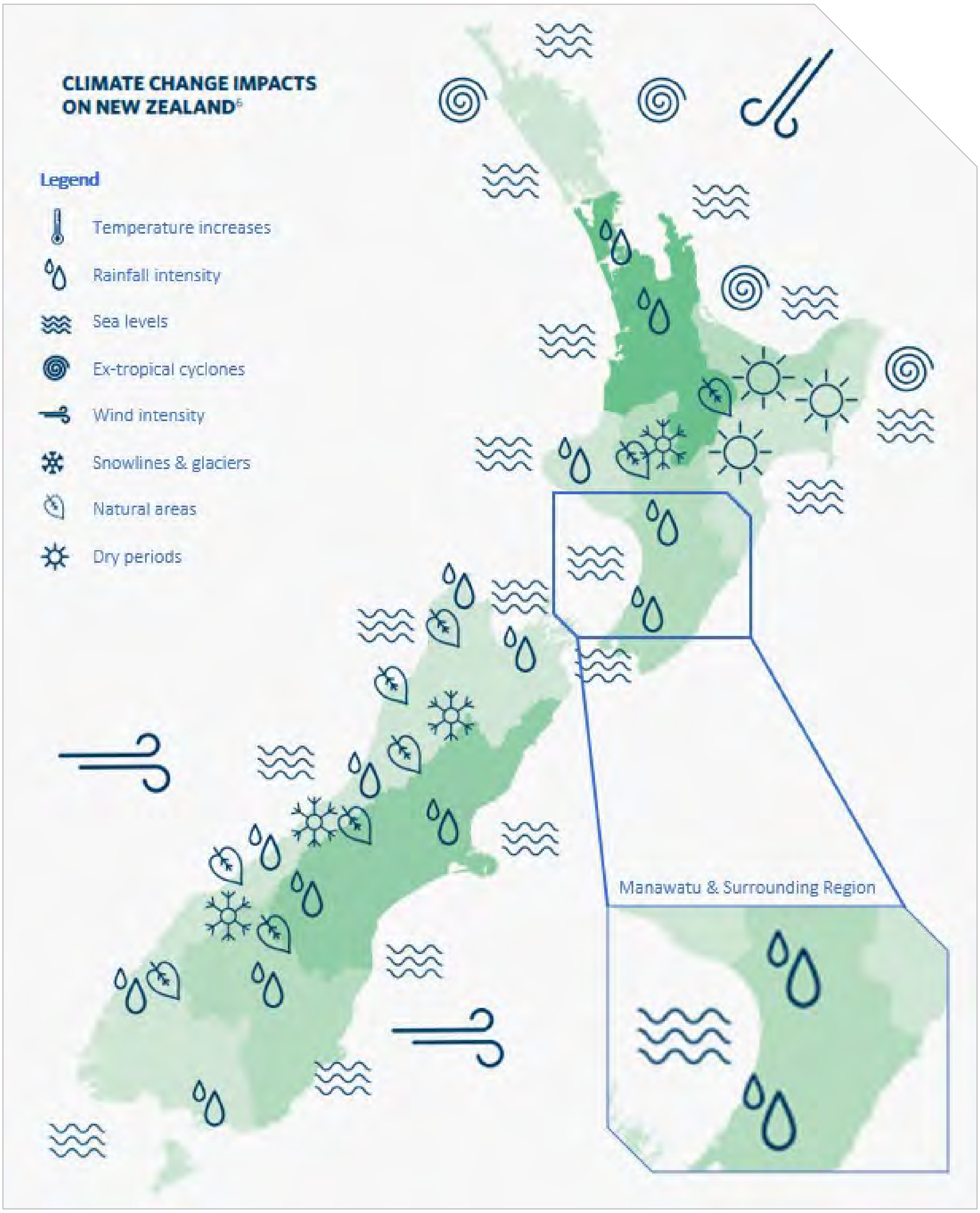


FIGURE 40: CLIMATIC CHANGE IMPACT MAP OF NEW ZEALAND (SOURCE: ARATAKI, NZTA)

The two primary climatic impacts identified for the Manawatū District to mitigate will be:

Wet weather events (immediate impact), resulting in:

- Increased precipitation
- Increased intensity of precipitation
- Increased flooding (particularly in already flood-prone areas)
- Increased slips
- Increased soil erosion

Sea level change (longer term), leading to:

- Increased storm surges
- Coastal inundation
- Increased coastal erosion

6.4.2 Landslips

Further investigations into the maintenance cost revealed that over the past 5 years, landslips amounted to 30% of total maintenance spend and has been the highest spend item year-on-year between 2018 and 2022.

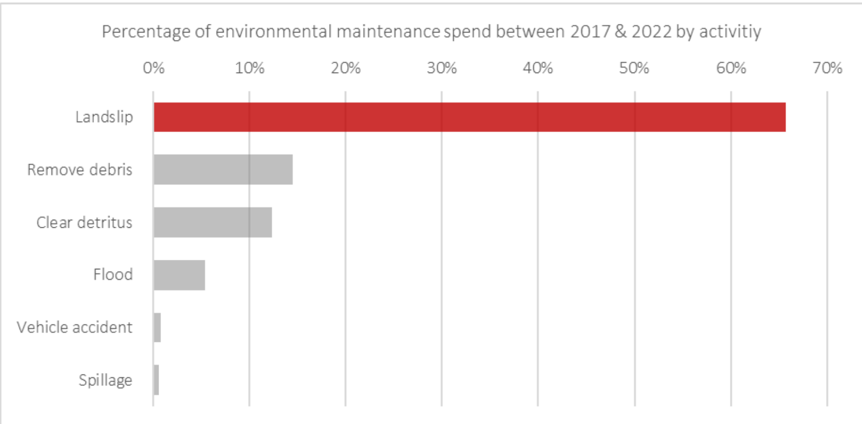


FIGURE 41: ENVIRONMENTAL MAINTENANCE SPEND BY ACTIVITY 2017-22

It can be seen in Figure 41 that the highest expenditure is related to the clearance of landslips. This amounts to nigh on 66% of MDC's environmental maintenance spend (*note: activities with <0.5% spend omitted from chart for clarity*).

The data also shows that this spend has decreased over the time (see Figure 42 below); the peaks in expenditure during 2017/18 and 2021/22 coincide with significant adverse weather events impacting the district. This high expenditure of has been as a result of the need to fund reactive works that would otherwise have been associated with emergency funding applications to NZTA. Delayed timescales in funding decisions - and reimbursement – regarding Emergency works claims have severely impacted Council's delivery of activities due to the need to use funds previously allocated to other maintenance activities.

FIGURE 42: COST TREND | LANDSLIP CLEARANCE

Table 23 below lists the roads on the network with the highest expenditure (locations over $200,000 highlighted in yellow):

TABLE 23: HIGHEST SPEND ON LANDSLIP CLEARANCE BY ROAD AND ONRC 2017-22

Road	*Low Volume*	*Access*	*Secondary Collector*	*Primary Collector*
Arapata Road	*232,027*			
Junction Road North	124,921			
Lethbridge Road			154,292	
Lower Pakihikura Road	119,776			
Main South Road	162,255	63,291		
Mangamako Road	193,685	4,256		
Mangarere Road	137,340			
Pohangina Road		194,954	6,131	2,237
Pohangina Valley East Road			*268,301*	
Rangitikei Valley Road		166,324		
Rangiwahia Road		96,026	103,691	
Reu Reu Road		*343,167*		
Ridge Road	166,382	6,613		
Ruahine Road		*748,103*	173,753	
Tunipo Road	129,666			
Total	***1,266,051***	***1,622,734***	***706,167***	***2,237***

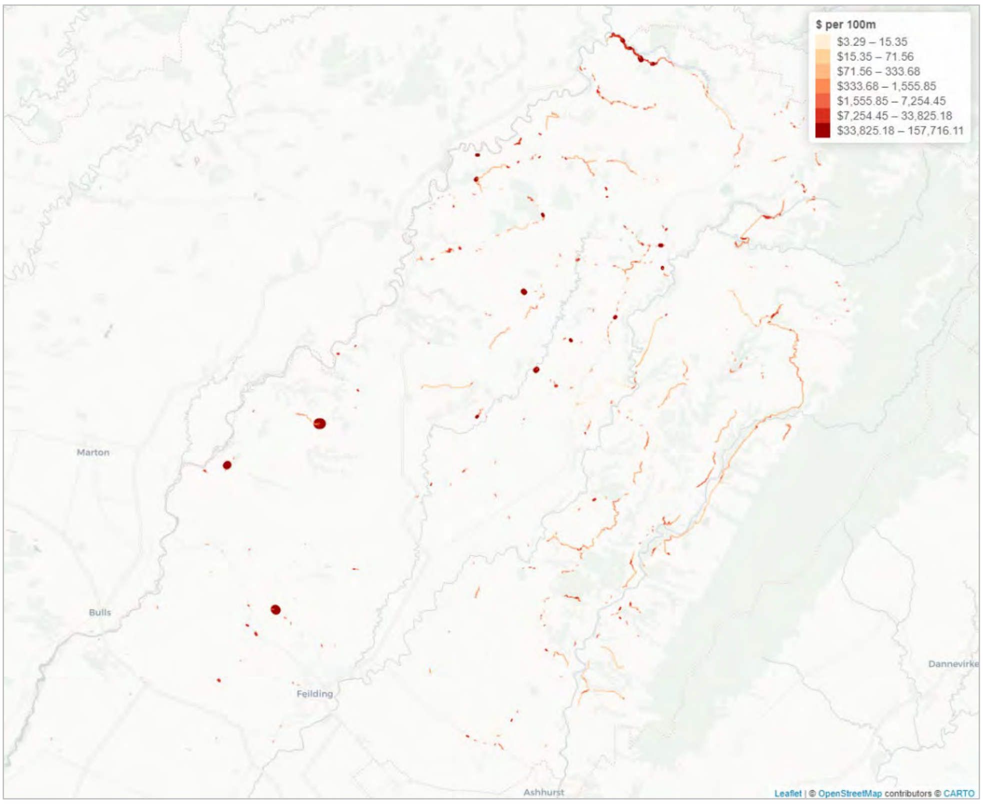


FIGURE 43: LOCATION OF MAINTENANCE SPEND ON LANDSLIP CLEARANCE 2017-22

The geographic location of these roads is also shown in Figure 43.

Ruahine Road (located at the top of this map) clearly stands out as the area of highest investment. Other 'hotspot' locations can also be seen, correlating with the highlighted roads in Table 23 above.

FIGURE 44: RUAHINE ROAD | FREQUENTLY OBSERVED CONDITION DUE TO SLIP ACTIVITY

Figure 44 shows a typical view of the Ruahine Road corridor at the bluffs, nearing the Rangitīkei River crossing. Given the frequency of landslip events requiring treatment on this road, it increases the exposure of road users to road safety risk; it is also worth noting the faded / obscured road markings and limited roadside protection that results from clearance operations. It is recommended that a medium to long-term improvement plan be instigated for this corridor, investigating the feasibility of geotechnical stabilisation, rock fall mitigation, etc, with a view to implementation in future funding periods.

6.4.3 Drainage

Maintenance spend on drainage activities over the last 5 years has been analysed to identify drainage concerns on the network (Figure 45). The most common activities are related to '*blocked*' assets and '*rubbish*' to be cleared.

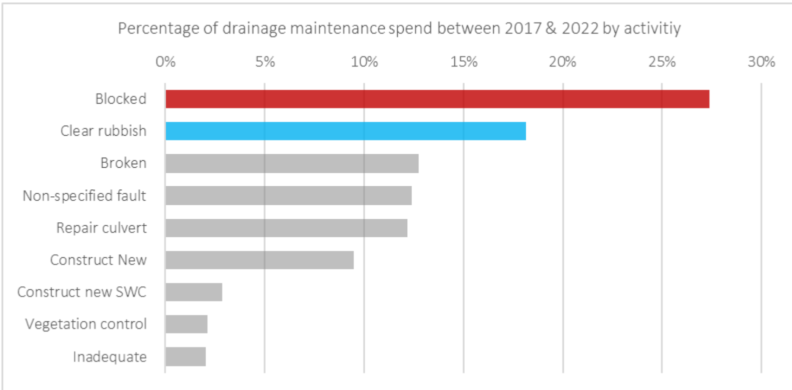


FIGURE 45: DRAINAGE MAINTENANCE SPEND BY ACTIVITY 2017-22

In combination, these 2 activities comprise approximately 45% of total maintenance spend. Also noted is that a considerable percentage of expenditure (12%) is allocated to '*non-specified faults*'. This lack of information may mean that Council is less able to identify and track specific maintenance issues across the network. Whilst there is some ambiguity in fault allocation, the quantity of spend across ONRC classifications can be observed. Figure 46 shows that a greater proportion of spend has been directed to Low Volume and Access roads, which correlates with MDC's network composition, and is to be expected. However, there is concern that the level of drainage maintenance expenditure has been declining since 2018/19. This reduction may be a likely consequence of funding being reallocated to environmental maintenance, in order to compensate for increased adverse weather conditions.

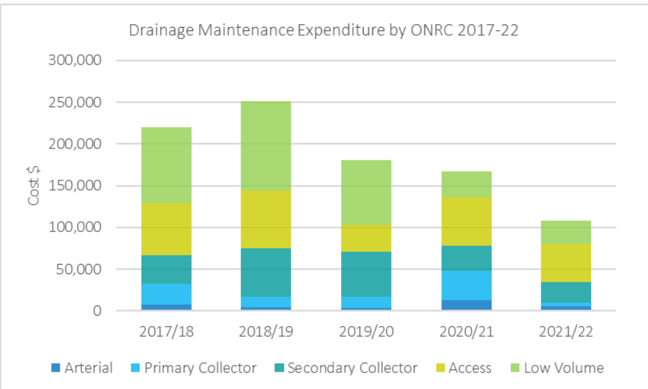


FIGURE 46: DRAINAGE MAINTENANCE COST BY ONRC 2017-22

Further analysis shows that the roads listed in Table 24 incurred the highest drainage expenditure between 2017/18 and 2021/22; some roads have been treated due to their status as forestry haul routes (assisting with retention of pavement strength), whilst others are known to be susceptible to recurring drainage issues (related to severe topography or flat terrain). If reoccurring sites are requiring clearance this may indicate the need for drainage improvements at these locations.

TABLE 24: ROADS WITH HIGHEST DRAINAGE EXPENDITURE 2017-22

Road	*Cost ($)*	*Mitigation focus*
Rangitikei Valley Road	49,571	Rangitikei River flood plain
Campbell Road	38,004	Flat terrain
Pōhangina Valley East Road	35,365	Topography
Mangapapa Road	35,191	Topography
Taipo Road	33,623	Flat terrain
Taonui Road	28,856	High yield forestry route
Awahuri Feilding Road	25,646	Capacity to mitigate stream flows from West Mangaone Stream
Waipuru Road	22,782	High yield forestry route

Continued review and management of roads with varying needs is required to effectively target drainage maintenance activity.

6.4.4 Structures and route detour impact

During Cyclone Gabrielle (February 2023) and later storm events (i.e., May 2023), intense rainfall to the district caused several rivers (including the Pōhangina and Oroua) to breach their banks. At the same time, copious quantities of forestry slash and riverbank trees were washed down, impacting on several bridge structures. These impacts ranged from significant debris build-up at piers to total loss of the asset:

FIGURE 47: EXEMPLARS OF ADVERSE WEATHER EVENT DAMAGE

Severe compromise of structural capacity (or complete loss) occurred to the following structures and forced significant temporary and ongoing route detours:

TABLE 25: STRUCTURES SIGNIFICANTLY IMPACTED BY ADVERSE WEATHER EVENTS

Road	*Waterway*	*Consequence*	*Detour to Feilding (usual route length in brackets)*
Churchill	Pōhangina River	Complete loss	72km (36km)
Pōhangina Valley East	Konewa Stream	Complete loss	70km (40km)
Pōhangina	Coal Creek	Irreparable critical element damage	72km (36km)
Pararorangi	Waituna Stream	Undermined pier collapse	No alternative

Since these most recent events, access over the Konewa Stream has been permanently reinstated. However, the Churchill Road, Pōhangina Road and Pararorangi Road structures will require substantial or complete replacement (see Figure 48 below), and have impacted 'business as usual' maintenance operations and budgets:

Churchill Rd (Pohangina River) | Pohangina Rd (Coal Creek) | Pararorangi Rd (Waituna Stream)

FIGURE 48: STRUCTURAL DAMAGE AND LOSS DUE TO ADVERSE WEATHER EVENTS

For Pōhangina Road and Pararorangi Road, ***temporary*** facilitation has been made which is currently providing (limited) access for most vehicle classes.

6.4.5 Investment benefits

Several roads around the Manawatū connect the forestry industry to the local, national and international markets. Addressing the identified issues on the network will deliver on the priorities defined in the GPS 2024 as well as achieve the amenity, mobility and accessibility level of service criteria.

6.4.6 Consequence of reduced investment

The number of landslips on the network are frequent and becoming increasingly debilitating, with some of the more vulnerable roads not having an alternative route. This is creating a heavy burden on Council, with a large portion of budgets associated with reactive maintenance being deployed at a number of locations. In addition to Ruahine Road, the roads highlighted below will benefit from ongoing monitoring and investigation, to identify whether future investment can reduce whole-of-life costs:

- Pohangina Road
- Pohangina Valley East Road
- Rangitikei Valley Road
- Reu Reu Road

With increasing climate change impact, there is an increased likelihood of disruption to key routes, particularly with limited alternatives. The consequence of this is an inconvenience to customers and associated detrimental effect on the economy. This consequence will attract increased complaints from businesses and the community.

6.4.7 Strategic response

- Continue to develop operational systems, capabilities, and immediate action plans
- Identify risks and reduce magnitude of their impact and likelihood of occurring
- Minimise the consequence to customers and the likelihood of unplanned events on route availability

To this end, Council has developed a flowchart to assist in determining the mix of interventions required in delivering the above strategy:

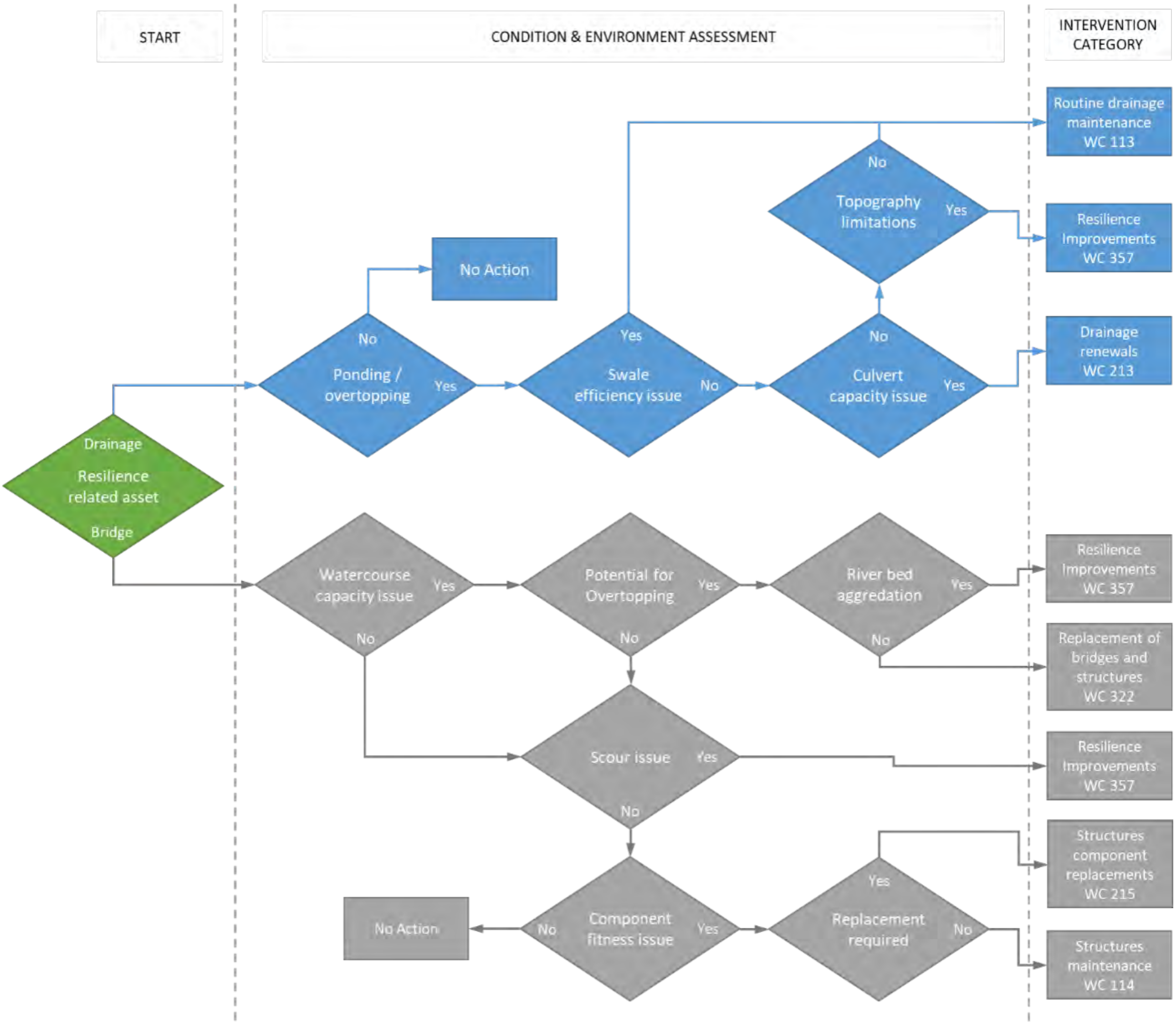


Figure 49 - Intervention Workflow, Management of Drainage and Structural Assets

Table 26: Strategic Response, Issue 2

Issue	*Findings / Status*	*Strategic Response*	*Priority*	*Focus*
Network resilience	Increasing frequency and severity of storm events are causing disruption to travel reliability and increasing Emergency Reinstatement costs	Replace compromised / missing bridge structures to reinstate network connectivity	HIGH	40%
		Focus routine drainage maintenance and renewals programmes to mitigate road closures to vulnerable portion(s) of the network	HIGH	
		Maintain bridge component replacement programmes to maintain capacity and route availability	MEDIUM	

6.5 Issue 3 | Safety

Given the level of Fatal and Serious crashes in the last 5 years, investment is required to achieve the 'Road 2 Zero' target of 'a 40% reduction on 2018 Fatal & Serious crashes'

6.5.1 Network level safety analysis

MegaMaps [19] indicates overall network safety performance via 2 measures; Collective and Personal Risk; it is a useful tool to begin safety analysis and monitor the network at a high level.

Collective Risk is a measure of the total estimated Death and Serious injury (DSi) casualty equivalence per km for each road segment. It is effectively a measure of the number of DSi's that can be expected on a road segment over 5 years. Figure 50 shows the latest output for Collective Risk. With a focus on crash numbers, roads with higher traffic volumes tend to feature more prominently.

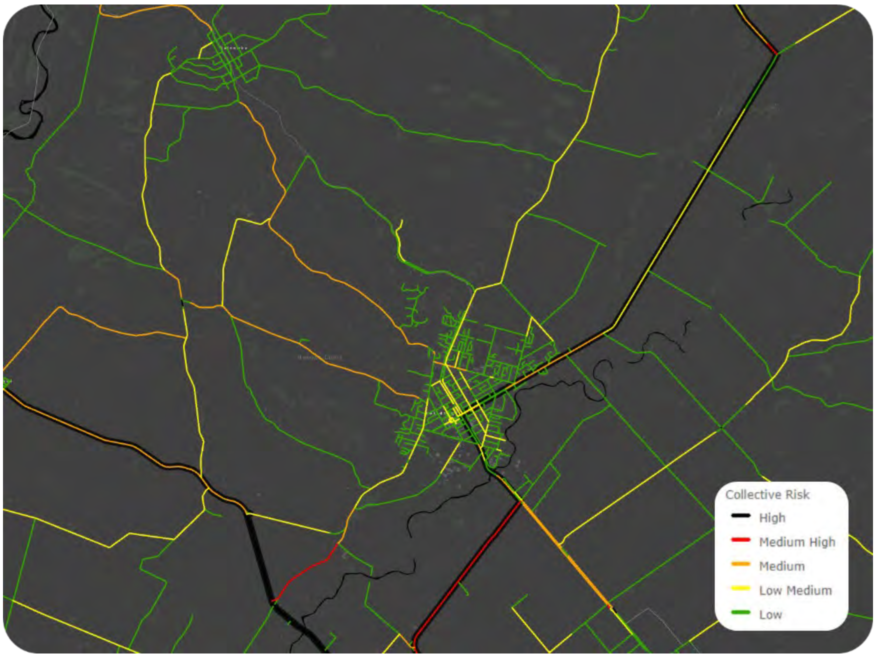


FIGURE 50: MEGAMAPS | COLLECTIVE RISK OUTPUT

FIGURE 51: MEGAMAPS | PERSONAL RISK OUTPUT

Personal Risk is a measure of the risk of an individual dying or being seriously injured on a road corridor. It is calculated by dividing the Collective Risk by traffic volume exposure.

As a consequence, this measure tends to highlight roads with low traffic volumes. Figure 51 shows that some sections of the local road network are considered to be high risk.

A comprehensive analysis of crash events on the local road network is undertaken by Council on a continual basis, including intersection related crashes (an annual 'Rural Crossroads' output exemplar can be found on the next page), crash type trends, causal factors, and regional comparisons.

[19] [Portal for ArcGIS - Sign In (nzta.govt.nz)](https://nzta.govt.nz) *(Login required)*

Rural Priority Crossroad — Crash Year — Crash Types (Incorporating Special Road User Types)

Road 1	Road 2	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
No.1 Line Longburn	Karere Rd			HA				HA	HA		HA
Kairanga Bunnythorpe Rd	Gillespies Line		HA	GD		LB	KB		HA	HA	HA
Milner Rd	Kellow Rd			HA					HA		
Taipo Rd / Rowe Rd	Waitohi Rd						JO			JA	
Colyton Rd	Taonui Rd		HA				HA				
Tangimoana Rd	Campion Rd						JA				
Rongotea Rd	Aranui Rd		HA			JA	KB		DF		
Colyton Rd	Watershed Rd							DF			
Sansons Rd / Main Drain Rd	Couper Rd / Milner Rd		DH								
Rongotea Rd	Kellow Rd						FB				
Rongotea Rd	Leen Rd / Cole Rd						HA				
Rongotea Rd	Lockwood Rd / Oroua Rd						FA	AA			
Tangimoana Rd	Taylor Rd			GC		HA					
Spur Rd	Watershed Rd / Midland Rd										

Road 1	Road 2	Movement Code	Cyclist	M/Cycle	DSI Equivalent	Movement Code	Cyclist	M/Cycle	DSI Equivalent	Movement Code	Cyclist	M/Cycle	DSI Equivalent	Movement Code	Cyclist	M/Cycle	DSI Equivalent	Movement Code	Cyclist	M/Cycle	DSI Equivalent	Movement Code	Cyclist	M/Cycle	DSI Equivalent
No.1 Line Longburn	Karere Rd	HA			0.50	HA			0.50	HA			0.50	HA			0.50	HA			0.50				
Kairanga Bunnythorpe Rd	Gillespies Line	HA			0.50	HA			0.50	GD			0.25	LB			0.35	KB			0.25	HA			0.50
Milner Rd	Kellow Rd	HA			0.50	HA			0.50																
Taipo Rd / Rowe Rd	Waitohi Rd	JO			0.36	JA			0.36																
Colyton Rd	Taonui Rd	HA			0.50	HA			0.50																
Tangimoana Rd	Campion Rd	JA			0.36																				
Rongotea Rd	Aranui Rd	DF			0.30	GD			0.25																
Colyton Rd	Watershed Rd	DF			0.30																				
Sansons Rd / Main Drain Rd	Couper Rd / Milner Rd	DH	Y		0.30																				
Rongotea Rd	Kellow Rd																								
Rongotea Rd	Leen Rd / Cole Rd																								
Rongotea Rd	Lockwood Rd / Oroua Rd																								
Tangimoana Rd	Taylor Rd																								
Spur Rd	Watershed Rd / Midland Rd																								

Road 1	Road 2	10 yr DSI Equivalent (All Crash Types)	Rank	Adj. Crash Count	10 yr DSI Eq. (Types AB, AE, DC, F-L & N)	Adj. Rank	5 Yr Adj. Crash Count	5 yr DSI Eq. (Types AB, AE, DC, G-L & N)	Collective Risk Rating (Table 4-1 HRIG)	AADT - $Q_{major\ 1}$	AADT - $Q_{major\ 2}$	AADT - $Q_{minor\ 1}$	AADT - $Q_{minor\ 2}$	Product of Flow (PoF)	Personal Risk Score	Personal Risk Rating (Table 4-2 HRIG)	Combined Risk Score (Collective x Personal)	Combined Personal & Collective Rank	LoSS Band (Table 4-3 HRIG) Based on PoF & Crash Count
No.1 Line Longburn	Karere Rd	2.50	2	5	2.50	2	2.50	1.25	Medium-high	2041	1986	286	286	201.43	20.00	Medium-high	25.00	1	LoSS V
Kairanga Bunnythorpe Rd	Gillespies Line	3.65	1	8	3.35	1	4.00	1.68	High	1277	1598	1379	3098	400.89	13.47	Medium	22.56	2	LoSS IV
Milner Rd	Kellow Rd	1.00	3	2	1.00	3	1.00	0.50	Low-medium	164	164	207	65	54.87	29.37	Medium-high	14.69	3	Outside Range
Taipo Rd / Rowe Rd	Waitohi Rd	0.72	5	2	0.72	5	1.00	0.36	Low-medium	542	743	396	138	124.09	9.35	Low-medium	3.37	4	LoSS III
Colyton Rd	Taonui Rd	1.00	3	2	1.00	3	1.00	0.50	Low-medium	2483	1472	1575	1575	395.69	4.07	Low	2.04	5	LoSS I
Tangimoana Rd	Campion Rd	0.36	7	1	0.36	6	0.50	0.18	Low	343	605	478	478	138.70	4.18	Low	0.75	6	LoSS III
Rongotea Rd	Aranui Rd	0.55	6	1	0.25	7	0.50	0.13	Low	2867	2441	413	219	234.12	1.72	Low	0.22	7	LoSS II
Colyton Rd	Watershed Rd	0.30	8																
Sansons Rd / Main Drain Rd	Couper Rd / Milner Rd	0.30	8																
Rongotea Rd	Kellow Rd																		
Rongotea Rd	Leen Rd / Cole Rd																		
Rongotea Rd	Lockwood Rd / Oroua Rd																		
Tangimoana Rd	Taylor Rd																		
Spur Rd	Watershed Rd / Midland Rd																		

Figure 4-5 : Intersection treatment - Safety Improvement Strategy

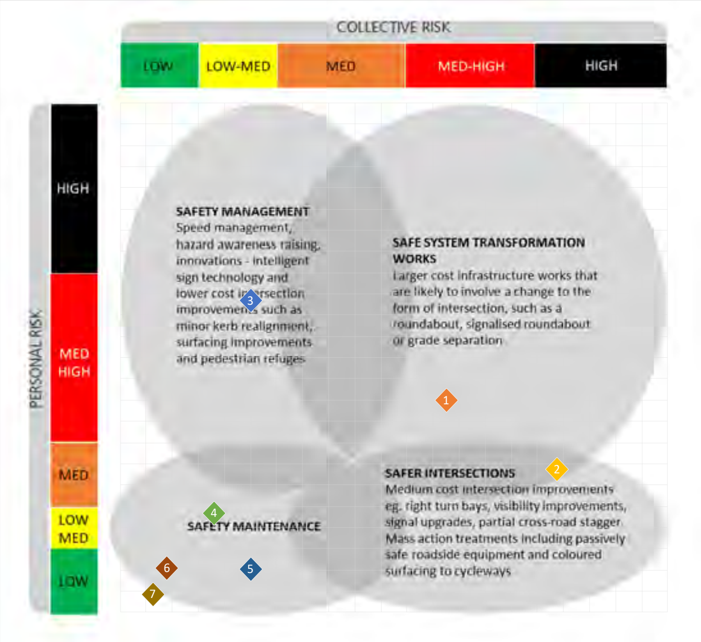


Table 4-1 : Criteria for identifying intersection collective risk

Collective Risk Level	Estimated DSI Equivalents (5 yrs)		
High		≥	1.6
Medium-high	1.1	-	1.6
Medium	0.6	-	1.1
Low-medium	0.3	-	0.6
Low	0.3	<	

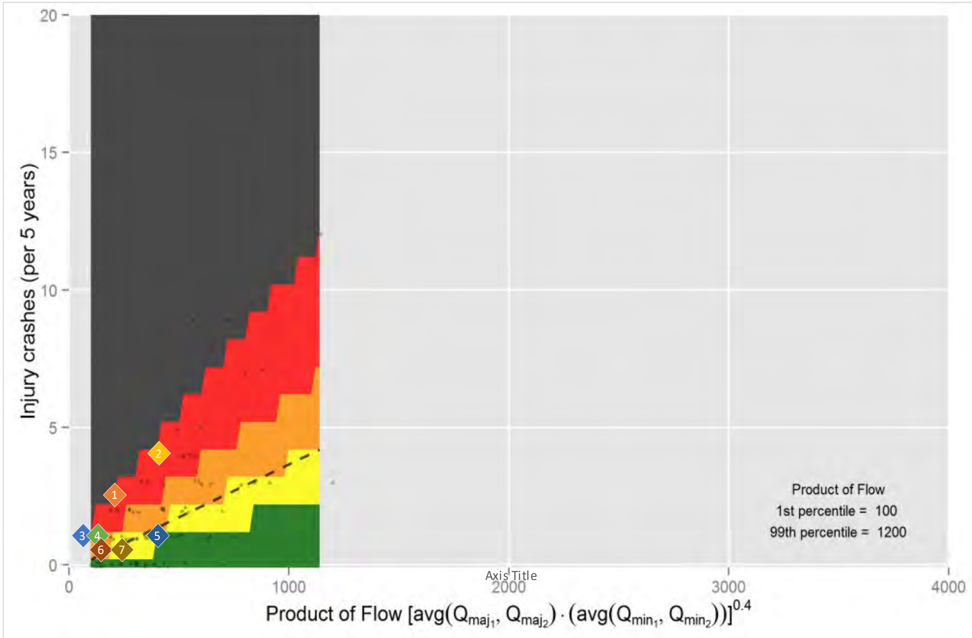
Table 4-2 : Personal risk levels and risk metric values

Personal Risk Level	Estimated DSI per 100 million vehicle kms		
High		>	32.0
Medium-high	16.0	-	32.0
Medium	10.0	-	16.0
Low-medium	6.0	-	10.0
Low	6.0	<	

Table 4-3 : Level of Safety Service bands

Level of Safety Service	Safety Performance	Definition
LoSS V	90-100th percentile	The observed injury crash rate is in the worst 10% band - higher (worse) than that expected of 90% of similar intersections
LoSS IV	70-90th percentile	The observed injury crash rate is in the worst 30%, lower (better) than that expected of 90% of similar intersections and higher (worse) than that of 70%
LoSS III	50-70th percentile	The observed injury crash rate is lower (better) than that expected of 70% of similar intersections and higher (worse) than that of 50%
LoSS II	30-50th percentile	The observed injury crash rate is lower (better) than that expected of 50% of similar intersections and higher than that of 30%
LoSS I	0-30th percentile	The observed injury crash rate is lower (better) than that expected of 30% of similar intersections

Figure A5-10 : LoSS Bands for Rural Priority Crossroad

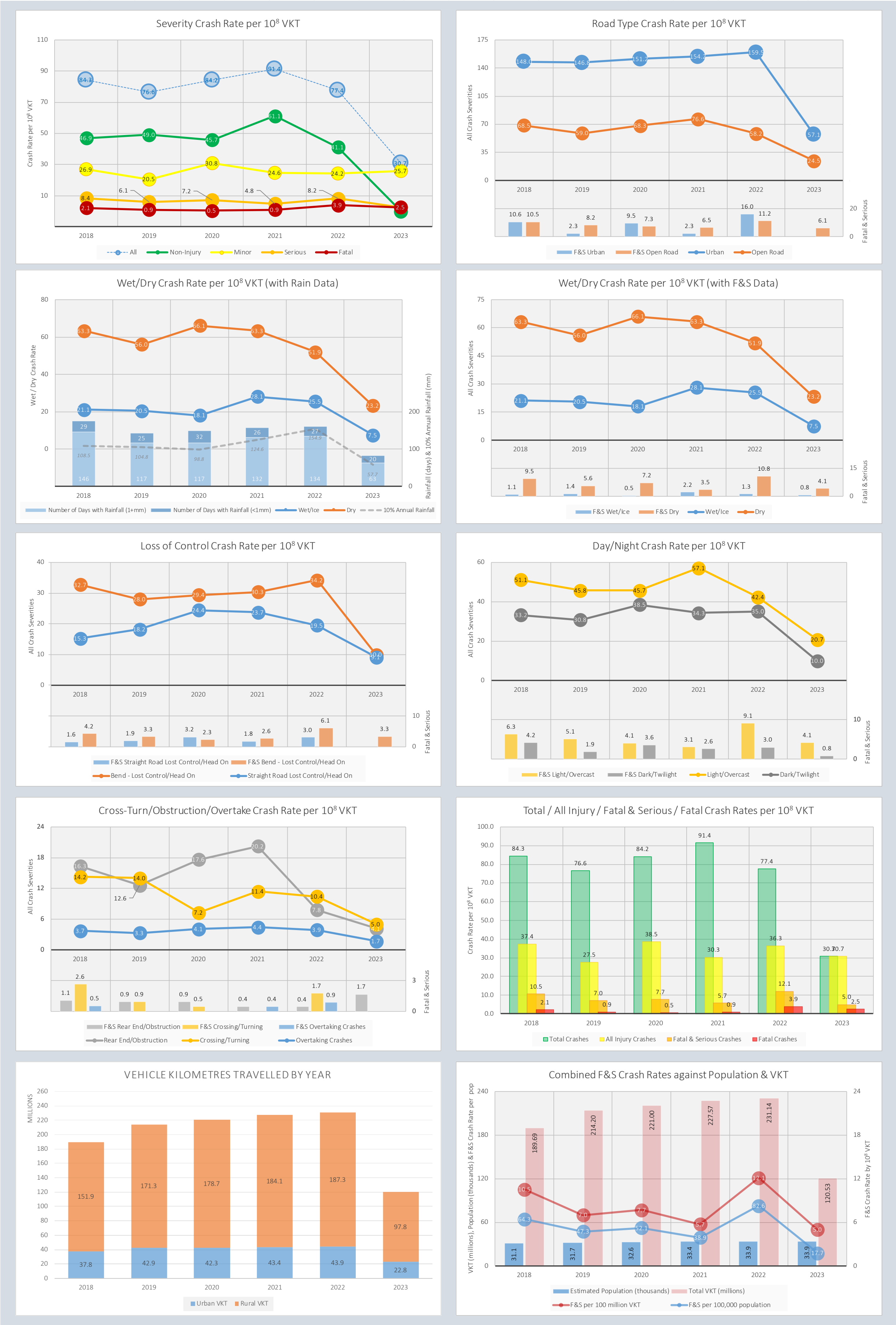


An annual analysis is also conducted for other intersection arrangements, including Rural T-intersections, Urban crossroads, Urban T-intersections, and Roundabouts (intersection types relevant to for the Manawatū local road network).

This analysis accounts for recent and past activities Council has undertaken to address crash issues (marked with pale yellow boxes in the '*crash year*' columns indicating an intervention of some kind was carried out). Risk calculations for these intersections are then carried out using only crash events occurring *after* the intervention(s), rather than blindly adding pre-intervention crashes and skewing residual risk.

Crash rate trend for previous 5 full years & latest data (to end June 2023):

(note: there is a 7 month delay in processing non-injury crashes at time of this AMP)



Fatal and Serious Crash rate trend, comparing MDC with it's Regional neighbours' local road networks:

(includes proportion of crashes in relation to traffic volumes and breakdown by major crash types)

It can be seen that, in general, the crash rate for fatal and serious crashes in the Manawatū is reducing as a result of Council's continuing intervention strategies from the previous AMP, including:

- Improved driver information along road corridors (i.e., curve advisories)
- Resurfacing to combat low skid resistance, and
- Delineation maintenance & improvements (i.e., pavement markings, audio-tactile-pavers, etc)

Continuing delivery of these programmes will aid in achieving the desired outcomes.

'*Crossing / turning*' crashes have reduced (although there has been a blip in more severe injuries observed through 2022). '*Loss of control on straight*' crashes appear to have reached their zenith in 2020, thereafter showing a declining trend.

| Fatal |	from 2018 to 2023	21
Alcohol	9	43%
Disabled, Old age or Illness	1	5%
Failed to Give Way or Stop	3	14%
Fatigue	0	0%
Incorrect Lanes or Position	4	19%
Miscellaneous Factors	5	24%
Overtaking	1	5%
Pedestrian Factors	0	0%
Poor Handling	3	14%
Poor Judgement	3	14%
Poor Observation	5	24%
Position on Road	6	29%
Road Factors	2	10%
Travel Speed	6	29%
Unknown	0	0%
Vehicle Factors	1	5%
Weather	0	0%
| Serious |	**from 2018 to 2023**	**80**
Alcohol	48	60%
Disabled, Old age or Illness	1	1%
Failed to Give Way or Stop	9	11%
Fatigue	4	5%
Incorrect Lanes or Position	19	24%
Miscellaneous Factors	4	5%
Overtaking	1	1%
Pedestrian Factors	1	1%
Poor Handling	14	18%
Poor Judgement	11	14%
Poor Observation	15	19%
Position on Road	18	23%
Road Factors	7	9%
Travel Speed	17	21%
Unknown	0	0%
Vehicle Factors	2	3%
Weather	0	0%
| Minor Injury |	**from 2018 to 2023**	**313**
Alcohol	93	30%
Disabled, Old age or Illness	11	4%
Failed to Give Way or Stop	56	18%
Fatigue	18	6%
Incorrect Lanes or Position	52	17%
Miscellaneous Factors	24	8%
Overtaking	5	2%
Pedestrian Factors	2	1%
Poor Handling	90	29%
Poor Judgement	37	12%
Poor Observation	101	32%
Position on Road	48	15%
Road Factors	40	13%
Travel Speed	71	23%
Unknown	0	0%
Vehicle Factors	11	4%
Weather	10	3%

FIGURE 52: CAUSAL FACTORS FOR CRASHES REPORTED SINCE 2018

There has been a significant increase in serious injuries to urban speed environments noted over the last year.

The increasing proclivity for road users to breach licence conditions continues to be observed. Of particular concern is:

A high proportion of fatal (43%) and serious (60%) crashes reported with driving under the influence of alcohol or drugs as a causal factor (see Figure 52 to left). This finding is also reflected in NZTA's latest '*Communities at Risk Register*' publication.

Other extraneous factors noted include:

- Potentially defective vehicles (expired WoF/CoF)
- Restricted & learner licence holders carrying unauthorised passengers and/or driving outside of allowable hours
- Restricted & learner licence holders that ride non-LAMS approved motorcycles

These breaches are considered causal factors that Council can combat ***with only limited success***, through:

- Additional warning signage at riskier locations (i.e., at intersections and out-of-context curves)
- Barrier installations at higher risk locations, and
- Application of an Urban focussed Speed Management Plan

6.5.2 Corridor level assessment

6.5.2.1 Fatal and serious crashes

In the latest 5½ year period from January 2018 to June 2023, there have been 99 fatal and serious injury crashes reported on Manawatū's local road network. This is in comparison to the previous 5½ year period (July 2012 to December 2017), where there were 92 reported crashes with a severity of injury rated as serious or fatal.

Figure 53 shows the location of all DSi crashes on local roads between January 2018 and June 2023.

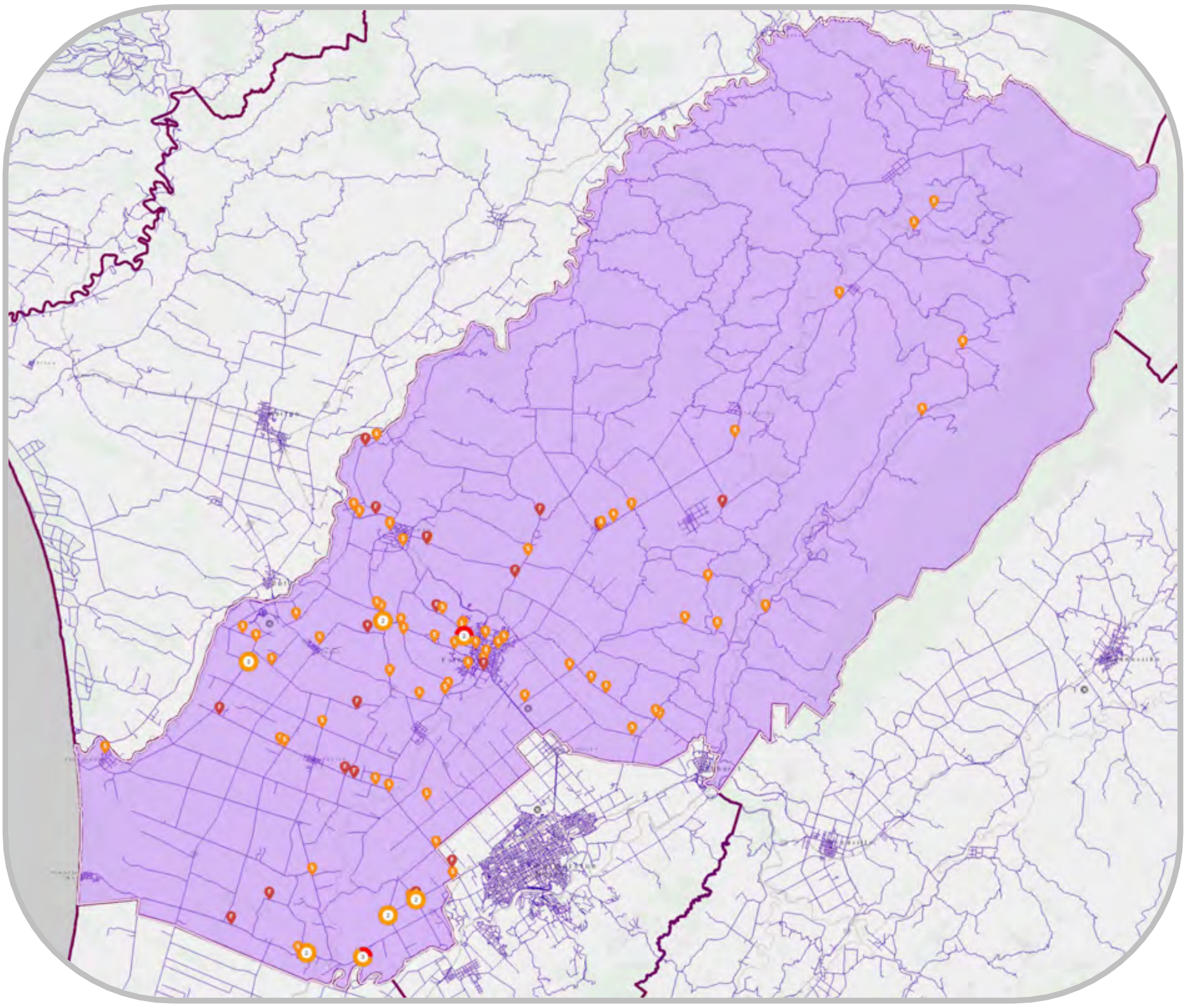


FIGURE 53: DSI CRASHES FROM JANUARY 2018 TO JUNE 2023 ON MANAWATŪ'S LOCAL ROAD NETWORK

Whilst there have been slightly more fatal and serious crashes reported in the latest period compared to previous (up by 7.6%), there has been a dramatic increase in traffic volume over the same period. Since 2013, VKT has increased from 183 million to an estimated 234 million (a 33.8% increase); the relative safety of the network over time could be considered to have improved (i.e., risk to our road users has effectively decreased).

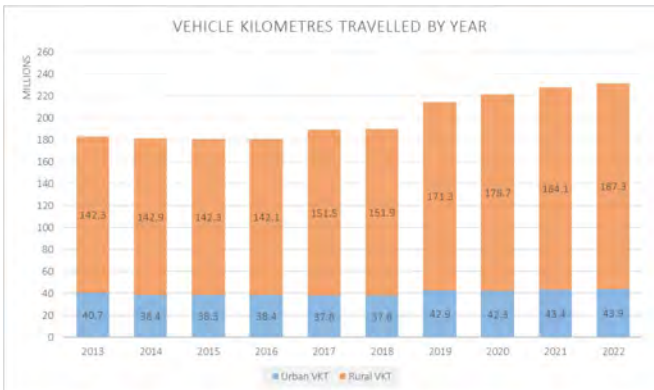


FIGURE 54: MDC VKT TREND 2013-22

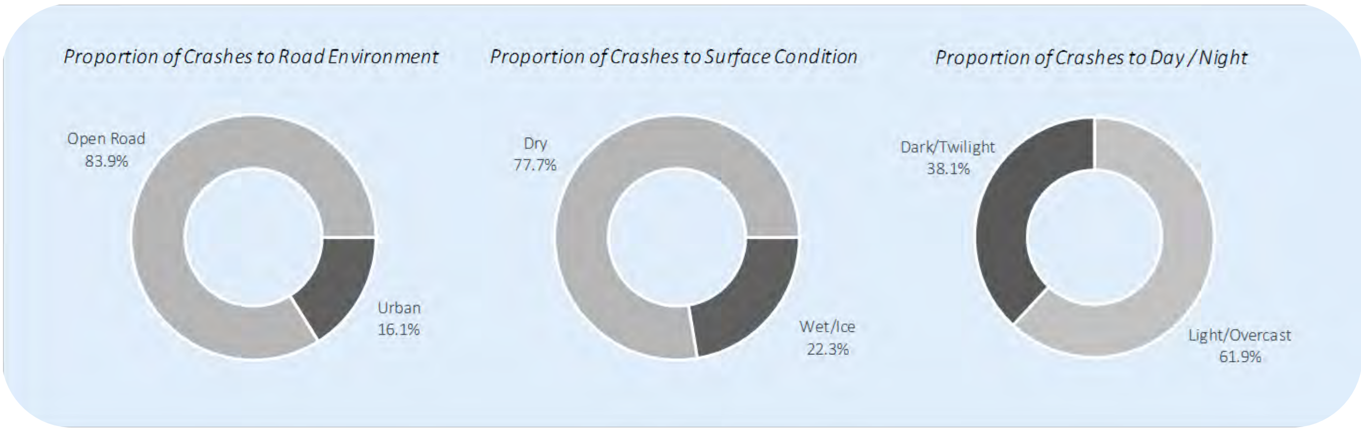


FIGURE 55: FATAL & SERIOUS CRASH PROPORTIONALITY (JAN 2018 TO JUN 2023) BY ENVIRONMENT

Whilst 64% of all reported crashes (between January 2018 and June 2023) took place on open roads (where the speed limit is generally in excess of 70kph), 83.9% of fatal and serious injury crashes took place to the same speed environment; this reflects:

- the rural nature of the network (90% rural to 10% urban)
- the proportion of rural to urban traffic volume (81% to 19%), and that
- higher speeds at impact lead to a higher probability of sustaining serious to fatal injury

and indicates that the district's open road environment deserves continued consideration for crash mitigation interventions.

6.5.2.2 Environmental factors

Figure 55 above shows that 38.1% of fatal and serious injury crashes have occurred in low light or night-time conditions between January 2018 and June 2023. This is comparable to low light / night-time crashes on New Zealand's entire local road network, calculated at 35.7% and a little worse in comparison with Manawatū's '*rural district*' peer group at 34.7% over the same period.

Similarly, crashes on wet roads within Manawatū's local road network occurred 22.3% of the time, whilst the entire NZ local road network exhibited 19.1% of crashes on wet roads over the same time period (and the '*rural district*' peer group with 17.9%).

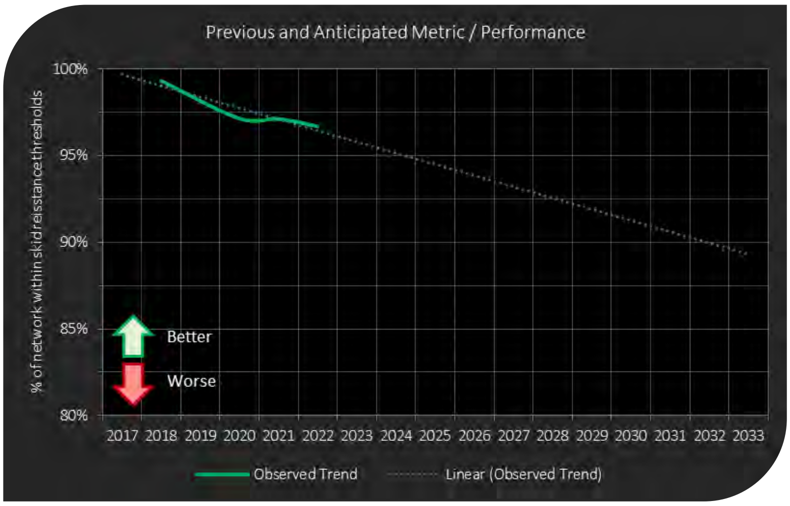


FIGURE 56: TREND OF SKID RESISTANCE ABOVE THRESHOLD(S) AS A CONSEQUENCE OF RECENT RESURFACING INVESTMENT LEVEL

Increasing rainfall intensities and volumes within the Manawatū district have been observed year-on-year; combined with increasing traffic on the network, greater exposure to wet driving conditions (and reduced skid resistance) will occur, supporting the need to focus on skid resistance management. Figure 56 shows the observed decline in the percentage of the sealed road network with skid resistance above the recommended threshold(s).

6.5.2.3 Crash Type Proclivity

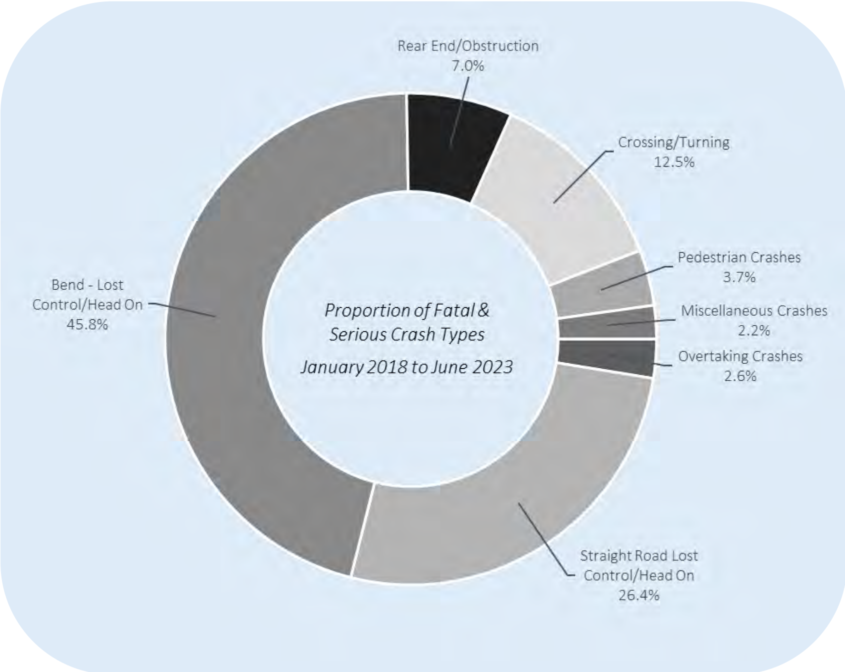


FIGURE 57: PROPORTION OF CRASH TYPES TO MDC NETWORK

As can be seen in Figure 57, the most common crash types experienced on the local road network are:

- ‘*Bend Loss of Control/Head on*’ (Bend LoC), and
- ‘*Straight Loss of Control/Head on*’ (Straight LoC).

(It should be noted that the vast majority of these crashes are of the ’Loss of Control’ variety, rather than head-on collisions, which have rarely occurred on MDC’s local road network).

Combined, these 2 crash types comprise 72.2% of fatal and serious crashes between January 2018 and June 2023. The trend for each of these crash types by year between 2018 and June 2023 (measured as the rate of crashes per 100 million VKT) is shown in Figure 58 (upper chart). There has been a general downward trend for Bend LoC crashes between 2018 and 2021, spiking in 2022, and returning to a lower proclivity in the current reporting year (to June 2023). A continued programme of curve advisory signage upgrades, improved (rural road) delineation, and resurfacing (maintaining skid resistance to assist braking and turning of vehicles) are recommended interventions to improve outcomes.

Straight LoC (run-off road) crashes show a general increasing trend (albeit at half the rate of Bend LoC type crashes), peaking in 2020. There have been no reported fatal and serious crashes reported so far in 2023.

Improved delineation and installation of audio tactile pavers (ATP) are effective interventions in combatting this type of crash; similar to those employed when addressing Bend LoC crashes.

‘*Rear End/Obstruction*’ and ‘*Crossing/Turning*’ crash types consist of 19.5% of fatal and serious crashes between January 2018 and June 2023. These types of crashes occur primarily at

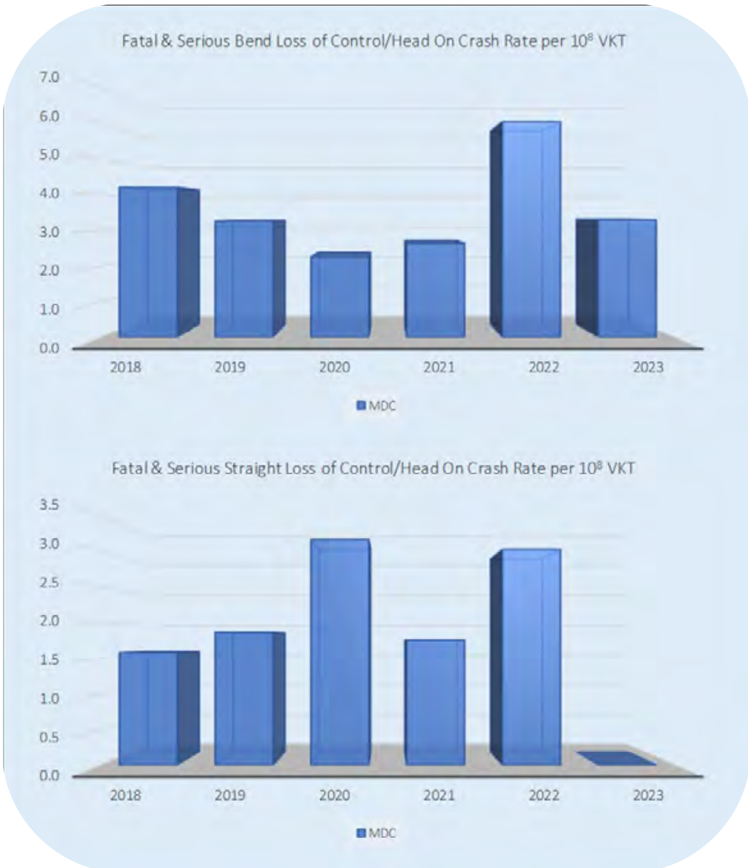


FIGURE 58: TREND OF BEND & STRAIGHT LOC CRASHES 2018-23

intersections and are analysed by Council on regular schedule (given the potential for serious injury to be incurred). Figure 59 below shows the general trend of crashes between January 2018 and June 2023. The upper (line) chart shows all recorded crashes (regardless of injury severity), whilst the lower (bar) chart reflects the count of fatal and serious crashes.

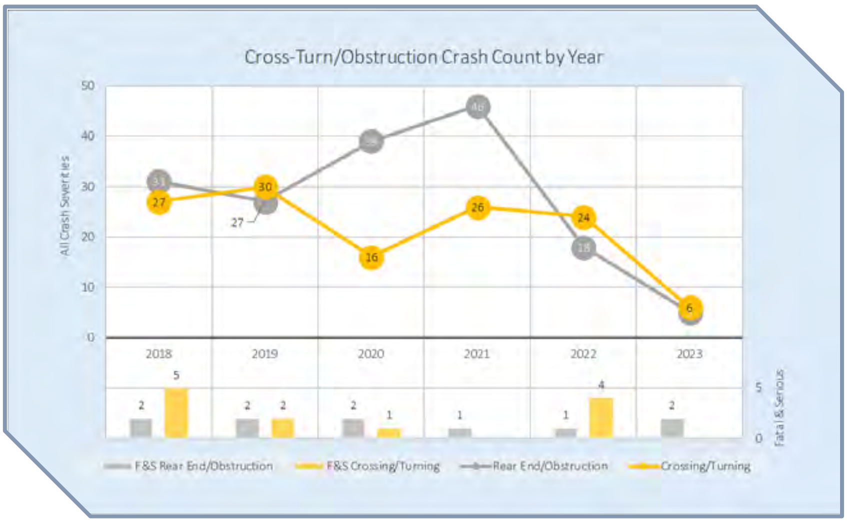


FIGURE 59: REAR END/OBSTRUCTION AND CROSSING/TURNING CRASH TREND 2018-23

There is an overall downward trend for these crash types, with occasional spikes observed (reflecting the relative rarity and high variability in frequency of these crash events).

A report by Abley Consultants in 2023 has been released by NZTA, assessing the risk of all rural crossroad intersections throughout New Zealand. This report has categorised a variety of interventions, dependent on each intersection's level of risk. The recommended intervention(s) have been summarised by NZTA and distributed to all RCA's for consideration and implementation under the *Local Road Improvements* Activity Class.

Manawatū District has already implemented (or has programmed) interventions for its higher risk rural intersections. The remaining, lower risk, locations have been collated for minor enhancements:

TABLE 27: MDC RURAL CROSSROAD INTERSECTION SIGNAGE & MARKING ENHANCEMENTS

Location and recommendation			*MDC Planned Intervention*		
Major road(s)	*Minor road(s)*	*Abley Indicative treatment level*	*Gate Signage*	*Advance Signage*	*Transverse Markings*
Rongotea	Aranui	*Enhance PLUS*			✓
Taipo	Waitohi	*Enhance PLUS*	✓		✓
No.1 Line Longburn	Karere	*Enhance PLUS*			
Tangimoana	Campion	*Enhance PLUS*	✓		✓
Rongotea	Cole / Leen	*Enhance PLUS*	✓		✓
Rongotea	Oroua / Lockwood	*Enhance PLUS*	✓		✓
Wilson / Mingaroa	Ngaio	*Enhance*	✓	✓	
Colyton	Watershed	*Enhance*	✓		
Taonui	Reid Line East	*Enhance*	✓		
Kaimatarau	Kellow	*Enhance*	✓		
Tangimoana	Rosina	*Enhance*	✓		
Rongotea	Hammond / Kellow	*Enhance*	✓		
Kimbolton North	Coulter / Perry	*Enhance*	✓		
Milner	Kellow	*Enhance*	✓		
Rangiotū	Puketotara / Pyke	*Enhance*	✓		

The number of urban intersection crashes has remained static over the five years. These crashes generally occur on dry roads during daylight hours. There are limited opportunities to improve this situation from an infrastructure perspective. It is notable that the only High-Risk intersections within the district are on State Highways, which are managed by NZTA.

6.5.3 Investment benefits

Investment in the network will improve safety for users in the district and will lead to MDC achieving better alignment with Road to Zero. In addition, investment would minimise the risk and consequences of crashes, resulting in:

- Reduced Collective Risk (Crash Density)
- Reduced Personal Risk (Crash Rate)

This will reflect in reduced social and economic cost to the district (& NZ as a whole) and deliver the following benefits in line with local, regional, and national strategic goals and well as meet level of service requirements for safety.

6.5.4 Consequence of reduced investment

Limiting budgets available for safety mitigation will likely result in an increased frequency of crashes, leading to increased death and disability, and culminating in continued significant financial cost to both society and individual(s). The current programmes that contribute to improvements to the rural network include:

- Resurfacing programme to manage and maintain appropriate skid resistance
- Improved driver information along road corridors (i.e., curve and intersection signage)
- Delineation maintenance & improvements (i.e., pavement markings, ATP, etc).

Increased investment in improving safety by continuing delivery of these programmes will aid in achieving the desired outcome of reducing deaths and serious injuries on our roads and contribute towards achieving the target set under Road to Zero of a 40% reduction in fatal and serious injuries from 2018 levels throughout New Zealand.

6.5.5 Strategic response

Council has developed the flowchart on the following page to assist in selection of safety interventions for various types of crash, along with prioritising said interventions.

The likely outcome of these interventions is summarised in Figure 60 to the right (not corridor specific).

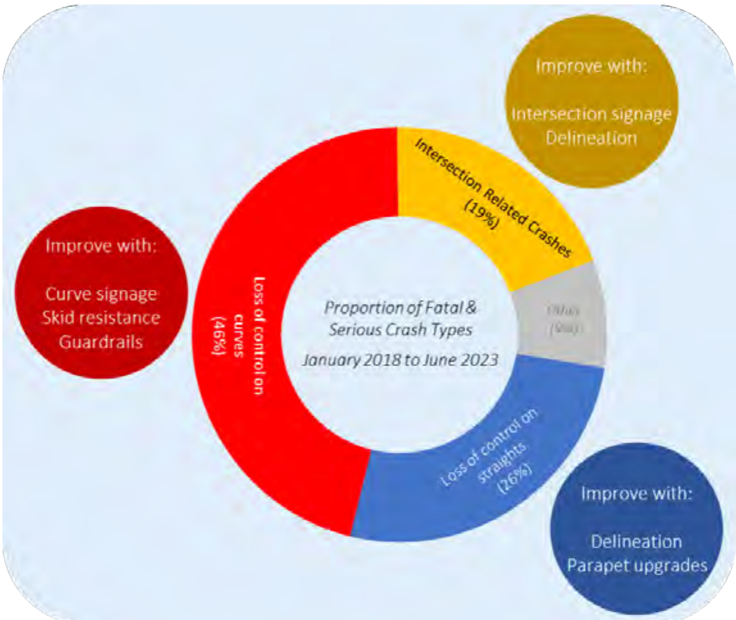


FIGURE 60: CRASH TYPE PROCLIVITY AND INTERVENTIONS

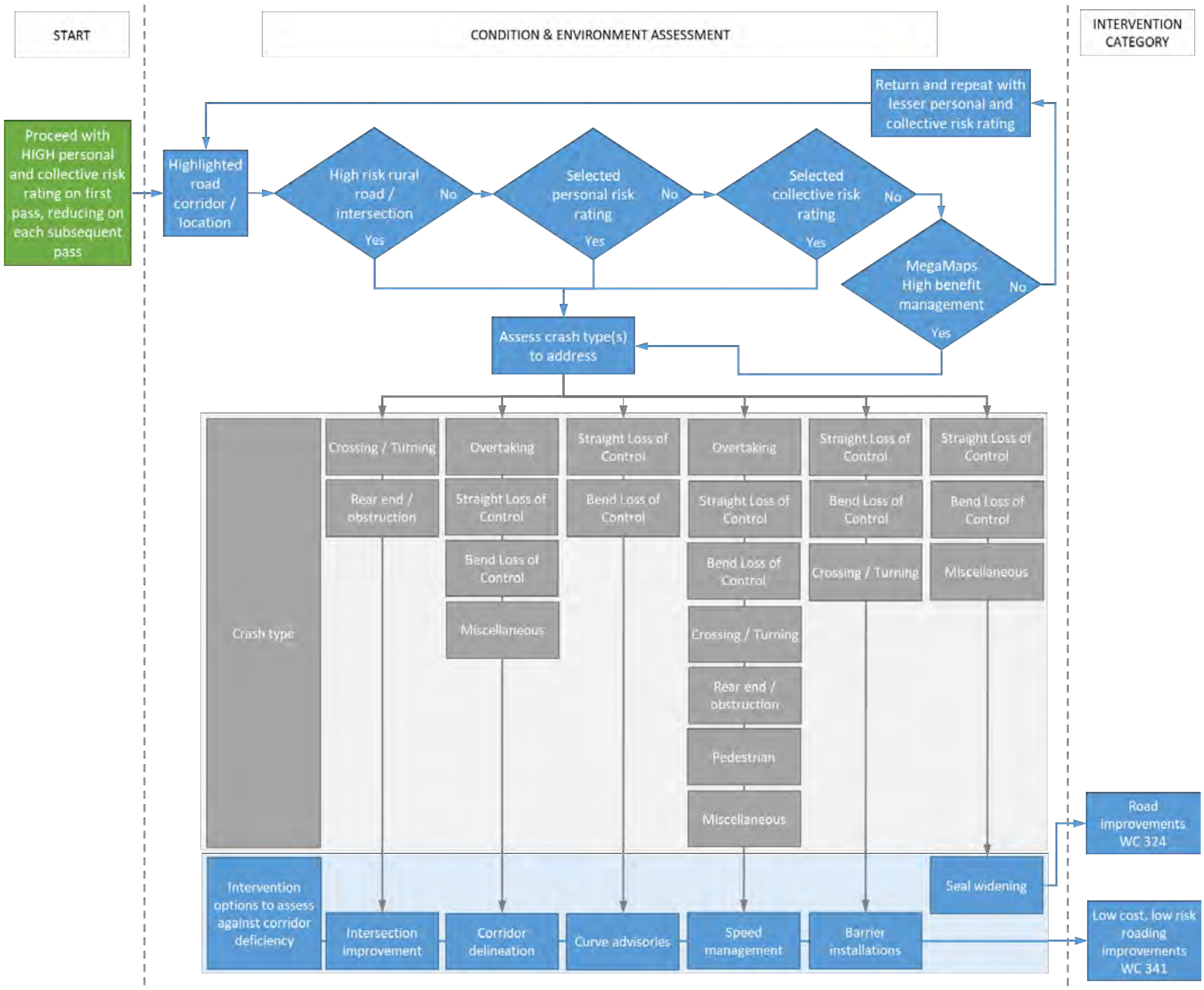


FIGURE 61: INTERVENTION WORKFLOW, SAFETY MANAGEMENT & PRIORITISATION

TABLE 28: STRATEGIC RESPONSE, ISSUE 3

Issue	*Findings / Status*	*Strategic Response*	*Priority*	*Focus*
Safety	Users of the road network experience a high personal risk (i.e., the rate of crashes resulting in serious injury or death is high) Loss of car control to bends, straights and crossing/turning at intersections are the primary contributing crash types Current programmes have seen an overall downward trend in crash rates	Monitor and improve safety at lowest performing intersections	HIGH	20%
		Improve driver information (e.g., curve signage) to lowest performing sealed road corridors	MEDIUM	
		Adapt and enhance the resurfacing programme to encapsulate and arrest downward skid resistance trend	MEDIUM	
		Upgrade existing, legacy parapets on bridges to compliant guardrails	MEDIUM	

7.0 Case for change

Without the appropriate funding, the problems outlined in Section 1.4 will compound over time and become more difficult for the Council to manage or resolve. This will have major impacts for the wider community and how it functions.

Climate change is impacting the network with greater intensity, with multiple Cyclone level events causing significant damage in recent months. Such events make the network vulnerable to closures and puts communities at risk of isolation and injury; these events are also becoming more frequent and have impacted the distribution of limited Council funds. Money originally allocated to maintenance, rehabilitation or reseals is being increasingly used to fund emergency work activity. NZTA's Emergency Fund process has a lengthy turnaround period, forcing the Council to put planned work on hold, and prioritise remedial work to the network in order to reinstate access for its residents.

The Manawatū road network is a critical part in sustaining the growth the economy. Forecasts show that over the next 6 years there will be continued pressure on the forestry routes. Currently, these routes are performing at an acceptable level, but they will be particularly susceptible to heavy vehicle damage the near future.

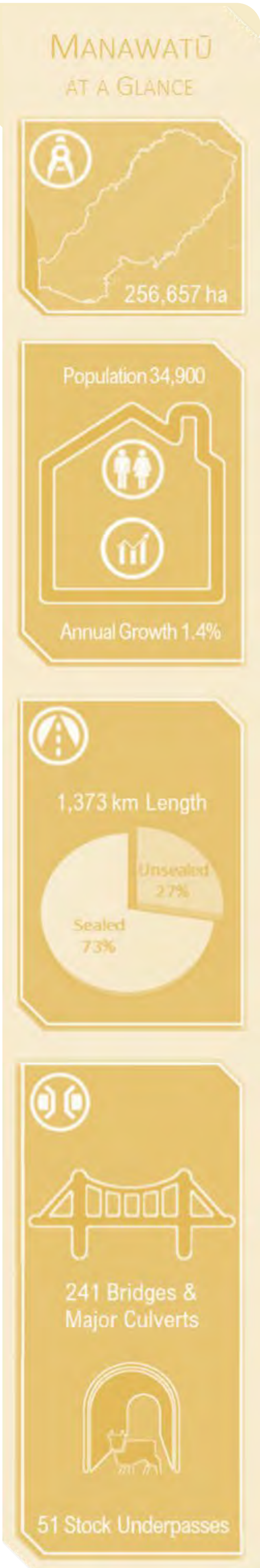
Landslides are frequent in the Manawatū, with some of the more vulnerable roads having no alternative route. This puts the Council under significant pressure, as a large portion of the maintenance budget is being reallocated to comparatively few locations across the network. With climate change impacts increasing, road closures are becoming more frequent[20]. This has implications for customers and the wider economy, as people may be isolated or delayed.

Without adequate funding for maintenance, road assets will exponentially deteriorate, negatively impacting user access safety and experience within the community.

[20] *Further evidenced by the impact to the network by cyclone Gabrielle in February 2023*

PART B | PROGRAMME BUSINESS CASE

1.1 Introduction



The Programme sets out the strategic response of the planned future state, and identifies a programme of works or activities that deliver on the strategic case, with asset management information that identifies maintenance, operations, renewals, and improvement/new works programmes. In order to address the strategic issues and problems stated, the preferred programme must address the problems relating to Legacy Network, Resilience, and Safety.

Funding for Manawatū District Local Roads Network is planned and allocated within 3-yearly cycles through the National Land Transport Programme (NLTP), allowing medium-term certainty and avoiding costly resource reallocation.

The (updated) draft GPS 2024 strategic priorities, re-released by the Ministry of Transport in March 2024 proposes to focus on the following strategic priorities (in no particular order):

1. Economic growth and increased productivity
2. Increased maintenance and resilience
3. Improved safety
4. Value for money

The GPS further states the '*Outcomes the Government expects will be achieved by this GPS*', some of which include:

> Reduced journey times and increased travel time reliability | more kilometres of the road network resealed and rehabilitated each year | fewer potholes | a more resilient network | a reduction in deaths and serious injuries | less expenditure on temporary traffic management.

Since the Manawatū is, by nature, a rural district, its investment programme therefore focusses primarily on priorities 2, 3, and 4 in order to give effect to the GPS.

1.2 Programme foundation

Through the 2024-27 AMP, Council aims to maximise the benefit derived from investment in maintaining, operating and improving the local road network as part of the transport system, and to grow the regional economy in a safe and sustainable manner. The 2024-27 AMP aims to achieve the right outcomes by targeting the right treatment or activity, in the right place, at the right time, and for the right cost.

In developing the 2024-27 AMP Council ensures that the expenditure associated with the programme of work fits within its allocated budgets. To do this, Council have implemented a rigorous programme development process to extract maximum value for money from our operations, maintenance, and improvements programmes.

The process has involved:

- Targeting the most important issues for our customers (Problems identified in Part A | Strategic Case)
- Identifying where we can make the greatest difference to improving journeys (Data Collection, Condition Surveys and RAMM)
- Identifying the best programme of activities we can implement to close level of service gaps (Multi-Criteria Analysis)

1.2.1 Identification of asset requirements

The identification of asset requirements dictates the standards of performance, condition and capacity and the consequential funding requirements. It requires knowledge of existing asset performance and performance targets to identify the gaps in asset performance. The analysis of existing assets is detailed in Part A | Section 4.1.

1.2.2 Maintaining a sound network condition

The Local Road network is generally in acceptable condition. In summary:

- Surface measures are beginning to deteriorate, albeit from a high baseline
- Roughness is considered acceptable on more than 80% of the network
- Rutting is indicating a slight decrease in performance
- Landslips/slope stability is increasingly becoming a maintenance issue for parts of the network
- Structures across the network are ageing and reaching the end of their useful life

Council should:

- Continue monitoring and report trends
- Focus investment strategies to minimise the risk of further deterioration of the network
- Implement a continuous programme of bridge and large culvert replacements, commencing 2027. This replacement programme will prioritise condition over age, in line with the existing recommendations

1.2.3 Working the asset

Having moved to the ONRC levels of service and - in some parts of the network - replacing assets later in their lifecycle, the local road network is becoming less frequently renewed. Continuation on this path is likely to result in more patched roads and less smooth journeys for customers, particularly on Access and Low Volume Roads. Notwithstanding this, road condition is continually monitored to ensure safety is not compromised.

1.2.4 Condition monitoring

Asset inventory and current condition data is a central aspect of road asset management. Inventory data such as reference number to road segments, road name, road category, road length, lane width and other dimensions, road location, road traffic (lane or overall), pavement age, seal age, shoulder and table drainage are important for locating assets, used for predicting performance over time and determining the cost of closing performance gaps.

Historically, High-Speed Data surveys have been undertaken on a 2-yearly basis, with Council procuring specialist services to collect and supply a range of data, including:

- Skid Resistance (left & right wheelpaths in 10m averages)
- Texture (left, right & Mid-wheelpaths in 10m averages)
- Rutting (left & right wheelpaths expressed in 20m averages)
- Roughness (left, right & Land IRI and NAASRA in 20m and 100m averages)
- Alignment Gradient, Crossfall and curvature (in 10m averages)
- GPS NZMG & NZTM (in 10m averages)
- Digital HD Widescreen Video (5m frames)
- Associated reports, including Skid Resistance & Texture Exception report

From July 2024, High-Speed Data surveys[21] will be procured and managed by the New Zealand Transport Agency Waka Kotahi (NZTA), using a regional contractual approach. It is envisaged that this data – when collected – will subsequently be distributed to the relevant Road Controlling Authorities (RCA's) to upload into their chosen asset management database.

> *It is important to note that whilst this data collection has been taken out of Council's hands, Skid Resistance measurement* ***will not*** *form part of this new arrangement. Council will still have to arrange collection of this metric independently, if it wishes to utilise this type of data as part of managing a network and its associated programmes.*

Council aims to continue condition monitoring, as well as forecasting remaining lives of other assets on the network. It is planned to do this through the Road Maintenance Contract (RMC) and other such contracts (i.e., the cyclic structural maintenance contract), together with any other NZTA specified network monitoring.

The RMC stipulates the requirements, specifications and level of monitoring on the network to ensure that adequate condition is maintained and that repairs are undertaken to a minimum standard. These contracts are the primary mechanism we have for understanding and monitoring road condition.

1.3 Programme funding

The Local Government Act (LGA) 2002 requires Council to prepare a Financial Strategy as part of its Long-Term Plan. This Strategy outlines how the Council intends to manage its finances prudently. This means the Council will act with careful deliberation and will always consider the financial implications of decisions on the community. Council must make adequate and effective provision to meet expenditure needs identified in Annual and Long-Term Plans.

Council's Financial Strategy provides a financial framework for making decisions. Simply, it enables Council to assess proposed spending against rates and borrowing requirements over the whole ten years of the Long-Term Plan 2024-34 (LTP).

The provision of services and projects comes at a cost. Council aims to spend within its means, achieving a balance between meeting the needs of the community with its ability to pay.

[21] The Road Efficiency Group Te Ringa Maimoa (REG) is leading the Consistent Condition Data Collection (CCDC). The aim is to establish a consistent approach to collecting pavement condition data for all local authority sealed roads starting 1 July 2024 through the 'Centre of Excellence' delivery model.

1.3.1 Funding sources

The funding sources for New Zealand's transport infrastructure and services funded through the NLTP are:

- funds from the National Land Transport Fund
- funds managed on behalf of the Ministry of Transport
- funds from Approved Organisations (the local share [22])
- funds from supplementary sources (i.e., Development Contributions)

Land transport activities managed or delivered on a regional basis by approved organisations are part-funded from the NLTF according to the relevant funding assistance rate [23]. The local share may come from rates or other sources, such as developer contributions, borrowing and investments.

1.3.2 Council contribution

Rates are a property tax set annually by Council. Rates are one source of income the Council uses to fund projects and operating services. Council considers the affordability of the proposed rate requirements both for the Council and ratepayers. When setting rates Council considers:

- the levels of service provided
- intergenerational issues
- other sources of funds
- legislative requirements
- external factors
- what our ratepayers can afford

A minimal amount of investment income is generated by Council's investment in forestry assets, and can be used to offset rates.

1.3.3 Supplementary funding sources

Supplementary funding sources for transport activities can include:

- development and financial contributions from land developers, recognising organising the benefits to their developments arising from transport infrastructure improvements
- betterment [24] contributions from landowners who benefit from road improvements
- other contributions from approved organisations, community groups or other entities, such as funding from the Accident Compensation Corporation (ACC)
- funds generated from road tolls for new land transport infrastructure

1.3.4 Funding risk

The ultimate limiting factor governing decisions on which projects can be included in Council's Long Term Plan, the Regional Land Transport Plan (RLTP) and the National Land Transport Programme (NLTP) is the level of available funding. Setting this level

[22] *The local share is the portion of the total cost of an activity that is provided by an Approved Organisation*
[23] *The funding assistance rate is the percentage of the total cost of an approved activity that NZTA provides*
[24] *'Betterment' is the increased value of land arising from improved access*

of funding is a complex matter requiring numerous iterations of the process. When seeking NZTA subsidies, Council has to ensure that it can meet the local share before submission.

Where activities within Council's proposed Roading Programme are eligible for financial assistance, NZTA provided a sinking rate in the previous AMP, reducing from 53% in 2021-22 to 51% in 2023-24. This subsidy is known as the Financial Assistance Rate (FAR). Council anticipates no further changes to the FAR; it is expected to remain constant for the 2024-27 funding period.

Council also utilises the Business and Economic Research Ltd (BERL) reports when anticipating cost escalations for the next 10 years, portrayed as a year-on-year percentage increase between 2024 and 2033.

2 main factors with evidenced and potential future impacts on cost are:

Demand changes

Growth in vehicle kilometres travelled (VKT) and HPMV impacts adding wear and tear on the network, along with increased transport due to growth areas and industrial developments. Figure 62 shows the increase in VKT observed to the local road network (split by road environment) between 2018 and 2022.

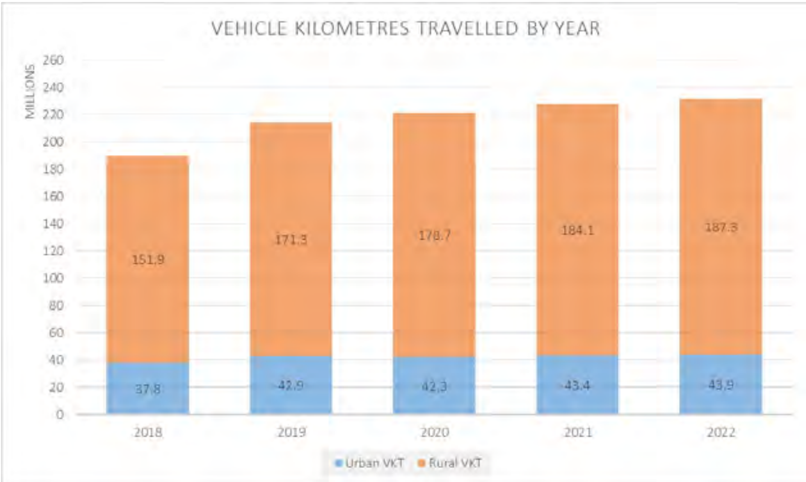


FIGURE 62: TRAFFIC VOLUME TREND FOR MDC BETWEEN 2018 AND 2022

Cost Index fluctuations

Rising bitumen and construction costs have been particularly evident due to market supply pressures, international currency matters and political upheaval. The lefthand chart in Figure 63 shows the volatility in cost adjustment for bitumen between January 2018 and May 2023. The righthand chart shows the Construction Index profile between March 2018 and December 2022:

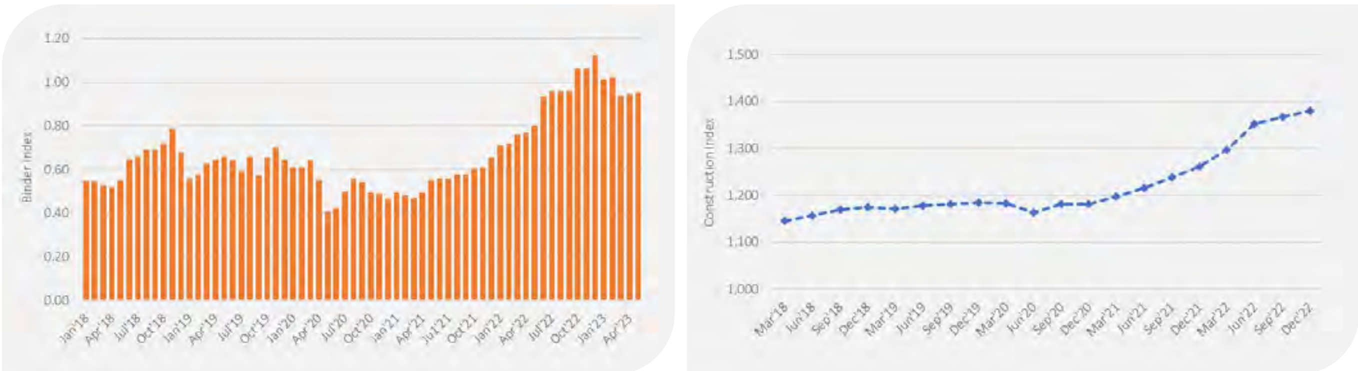


FIGURE 63: COST ADJUSTMENTS TREND FOR BITUMEN (LEFT CHART) & CONSTRUCTION (RIGHT CHART) INDICES

In summary, the key funding risks to the Programme are:

- NZTA reducing the FAR and/or the overall funding ceiling
- Council funding sources are reduced or become constrained
- Higher than anticipated cost escalations
- Other unanticipated demand fluctuations due to external factors

1.4 Performance measures

In order to understand the network's maintenance and renewals requirements, it is assessed against defined measures. While the ONF is being incorporated into the asset management processes, the ONRC Customer level of Service (CLoS) continues to guide the performance measurement criteria defined in Council's maintenance contracts and helps understand the network conditions. The CLoS principles are outlined below.

TABLE 29: CLOS DESCRIPTIONS

Icon	*CLoS*	*Description*
	Efficiency	Measures "Value for Money" and the optimisation of whole of life costs, with the intention to programme works to maximise existing asset.
	Safety	Minimise the risk of crashes by mitigating hazards along road infrastructure. Maintaining safety at every work site. Minimise the consequence of crashes by maintaining bridge side rails, guardrails, wire rope barriers and crash cushions, etc. Reduce the consequence of crashes by maintaining appropriate road standards and identify and manage noncompliant road sections. Reduce the risk of crashes at night by maintaining lighting to facilitate safe movement. Reduce the risk of loss of control crashes by reducing maintenance related faults (rutting / depressions, shoving, potholes, corrugated length, bleeding, ponding water, etc) and mitigate areas with surface friction deficiencies. Minimise risk of crashes to active road users by maintaining footpaths to acceptable levels and minimising the number of maintenance related hazard.
	Resilience	Mitigation to avoid route closure where appropriate by treating high risk slopes and maintaining road network and put in place a resilience plan. Provide Alternative Routes where appropriate.
	Amenity	Maintain the road environment and facilities that support an appropriate level of comfortable ride
	Travel Time reliability	Manage the impact of activities and demand on the network through planning activities and events to minimise customer impacts.
	Accessibility	Maintain accessibility through the upkeep of wayfinding signage

The table on the following page shows how the approaches relate to the ONRC performance measures, either directly or indirectly.

TABLE 30 - DIRECT AND INDIRECT IMPACT ON PERFORMANCE MEASURES BY WORK CATEGORY & ACTIVITY CLASS

WC	*Work Category*										
Influence		Direct	Indirect	Direct	Indirect	Direct	Indirect	Direct	Indirect	Direct	Indirect
	Local Road Pothole Prevention										
111	Sealed Pavement Maintenance	✓				✓	✓				
112	Unsealed Pavement Maintenance	✓				✓					
113	Routine Drainage Maintenance				✓		✓				
211	Unsealed Roads Metalling	✓				✓					
212	Sealed Roads Resurfacing	✓									
213	Drainage Renewals		✓		✓		✓				
214	Sealed Road Pavement Rehabilitation	✓				✓	✓				
	Local Road Operations										
114	Structures Maintenance	✓									
121	Environmental Maintenance	✓		✓	✓	✓		✓			
122	Network Service Maintenance	✓				✓				✓	
123	Network Operations	✓							✓		
131	Level Crossing Warning Devices	✓									
140	Minor events				✓						
141	Emergency Works										
151	Network & Asset Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
215	Structures Component Replacements	✓									
222	Traffic Services Renewal	✓				✓					✓
	Local Road Improvements										
216	Bridges & Structures Renewals		✓	✓			✓		✓	✓	
322	Bridge Replacements		✓	✓			✓		✓	✓	
324	Road Improvements	✓			✓		✓		✓		✓
325	Seal Extensions				✓	✓					
341	Low Cost – Low Risk		✓				✓				✓
357	Resilience improvements			✓							
	Walking and Cycling Improvements										
124	Cycle Path Maintenance	✓									✓
125	Footpath Maintenance		✓			✓			✓		
225	Footpath Renewals		✓			✓			✓		
451	Walking facilities	✓				✓			✓	✓	
452	Cycling facilities	✓				✓			✓	✓	
	Public Transport Infrastructure										
514	Public transport facilities O & M						✓				✓

Council identifies the community priorities and direction that the council wishes to deliver. In order to deliver these outcomes, it is important that the customer and technical performance measures and operational & maintenance contracts are clearly linked to achieve this. The following performance measures have been developed by MDC.

TABLE 31: MDC PERFORMANCE MEASURES

Primary Levels of Service	*Performance measures*
Road Safety	The number of fatalities and serious injury crashes on the local road network is lower than the previous financial year, expressed as a number.
Road Condition	80% of the road is in an acceptable condition - roughness NAASRA less than 150 and rutting less than 15mm
Road Maintenance	5% of the sealed local road network is resurfaced each year.
Response to Service Requests	90% of urgent requests will have service (Council or contractor) on site within three hours of the request being made. If the problem cannot be remedied immediately, the site will be made safe and remedial action carried out as soon as is reasonably practicable. 90% of non-urgent requests for service will result in the contractor on-site (including the repairs) within the three-month rolling programme, or as instructed by the Council's Roading Team

There are other stated Levels of Service (LoS) for other asset groups (e.g., footpaths). However, these are not differentiators and would not impact upon project breakdown or expenditure.

1.5 Programme development

Separate funds are allocated to the different programmes including investment, rehabilitation and periodic maintenance. To ensure efficient utilisation of Council’s resources and funds, the activities under these programmes are co-ordinated. The reasons for separating out maintenance are as follows:

- A large proportion of road maintenance work is of a routine and fixed nature and is not subjected to assessment and appraisal
- Periodic maintenance, e.g., resealing, is usually a case of timing and treatment selection with the aim of minimising the whole of life cycle costs, including road user costs, for the whole road network
- Major rehabilitation projects are appraised to identify the rehabilitation needs using a whole of life cycle cost minimisation. For each identified maintenance project, Net Present Value (NPV) calculations are carried out to rank the selection and timing of rehabilitation treatments
- Growth projects are appraised and developed using the Business Case Approach

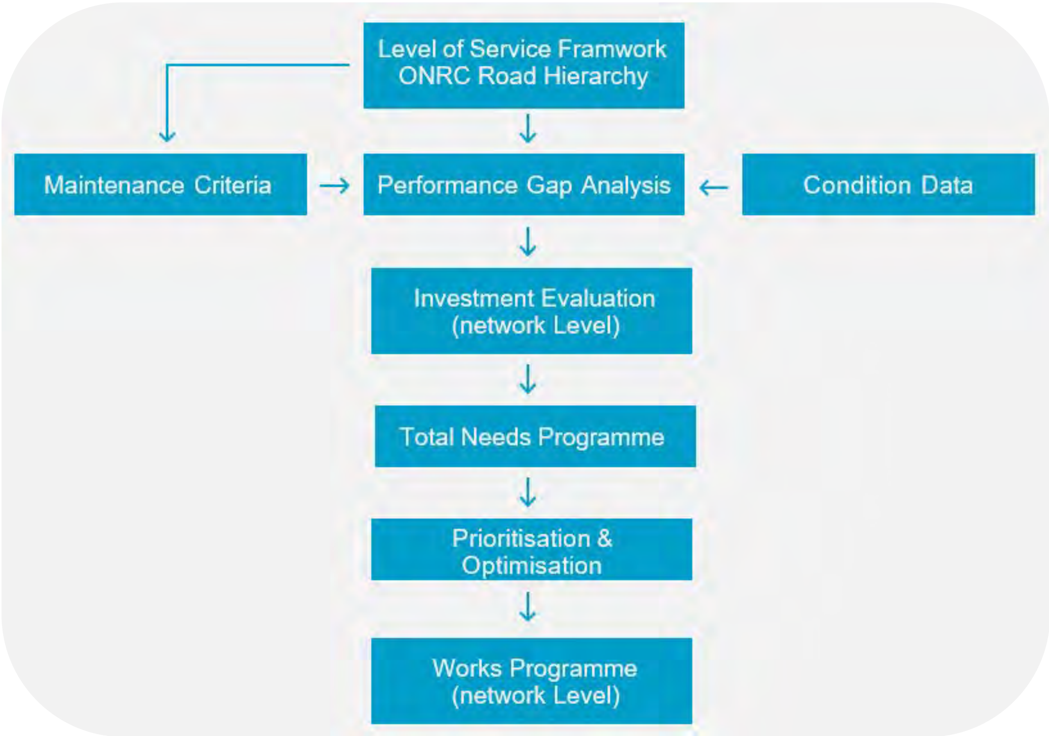


FIGURE 64: PROCESS OF WORKS PROGRAMME DEVELOPMENT AT THE NETWORK LEVEL

Figure 64 shows the process of works programme development at the network level.

The needs are then evaluated to identify optimal intervention options (maintenance and rehabilitation treatments) to close the asset performance gap and establish budgetary requirements. In a generic sense, the options that minimise Council and road user costs, in a life cycle cost context, are considered to be optimal. These intervention options comprise the total needs programme.

To ensure an equitable allocation of resources and to achieve Council's desired outcomes, prioritisation and optimisation techniques are used to identify the optimum combination of projects that could be achieved under different funding scenarios. As well as aiming at minimising life cycle costs, the process of optimising and prioritising includes consideration of strategic network requirements and strategic corridor improvements.

The result of prioritisation and/or optimisation leads to the identification of the works programme. The final works programme includes the funding required for the different maintenance programmes, together with details of the specific works.

The 3-year rolling programme for road network maintenance management facilitates the preparation of medium-term budgets and the planning of resources and maintenance activities. The 3-year programme is reviewed annually, considering deferred projects from the previous year's programme, the backlog of needs, and the availability of resources.

1.5.1 Programme optimisation

The programme has been optimised for both the mix and timing of interventions and there is an appropriate procurement approach to deliver value for money in the short, medium, and long term. For the programme optimisation Council chose to use NZTA's framework and guidance to ensure we achieve value for money, while achieving the key outcomes required from our land transport.

1.5.2 NZTA investment decision making framework

NZTA makes use of various investment assessment tools including Multi-Criteria Analysis (MCA). Appropriate criteria can be selected on a case-by-case basis, but investment objectives and critical success factors need to be included as part of all assessments. As part of this framework, decision making criteria include:

- **Investment Objective and Relevant Transport Outcome:** Aligned with National Transport Outcomes, including the GPS, which sets out the government's priorities for expenditure over a 10-year period
- **Critical Success Factors:** Practical considerations dictating whether a project can be implemented, including:

  Achievability/Feasibility | Potential affordability | Potential value for money | Supplier capacity & capability | Urgency
- **Opportunities and Impacts:** These can include:

  Environmental effects | Social and cultural effects | Climate change mitigation or adaption | Cumulative impacts | Impacts on Te Ao Māori | Property Impacts
- **Economic Assessment:** Benefit–cost ratio (BCR) or end-of-life net present value (NPV)

1.5.3 Council's project prioritisation criteria

Historically, MDC have based Forward Works Plans on a combination of known network issues, customer feedback and cyclic maintenance. A review of the 2021-24 AMP (conducted by REG) highlighted a gap in Council's preferred programme selection, omitting a consequence assessment for alternative investment level(s).

In considering this, an MCA evaluation was undertaken, evaluating relative priority of maintenance, renewals, and improvement projects. The chosen criteria (see Table 32 below) scores programme options across aspects that are important to Manawatū District Council (MDC), and were chosen based on the likelihood of providing some differentiation[25]:

TABLE 32: MCA CRITERIA

Criteria	*Questions Answered*	*Key Factors Assessed*
Resilience	How strongly does the programme align with this Council investment objective?	Reliability, the structures durability and resilience against natural disasters
Condition	How strongly does the programme align with this Council investment objective?	The physical condition of the road
Safety	How strongly does the programme align with this Council investment objective?	Impact on road user safety
Customer Satisfaction	Will it contribute to service reliability and meeting customer service level expectations?	Addresses previous issues/concerns raised by the public
Service Delivery	How important is this programme in contributing to the delivery of Council's core activities and services?	Ability of contractor and the construction industry to deliver the resources and material in the current market
Financial Impacts	What is the return on investment or financial benefit? Does the project provide value for money?	Ability of the investment to provide Value for Money i.e., improve overall network performance

[25] *The Customer Level of Service measures have been incorporated into the Criteria where possible. For an AMP Travel Time Reliability, Optimal Speed, Amenity and Accessibility will not be key differentiators and was therefore excluded from the MCA.*

1.5.4 Assessment and scoring

The MCA process outlined in the previous section was undertaken separately for a variety of activities that make up an AMP, namely:

Maintenance	Renewals	Road Improvements	Active Transport	Public Transport

The MCA is a qualitative analysis using specialist judgement and was undertaken in two stages:

Stage 1 assessed the Baseline Forward Works Plan (FWP) against the existing network condition (essentially a '*No change from existing*' scenario). This assessment allows the value and consequence of the baseline investment to be shown.

Stage 2 of the assessment compares the FWP Options (i.e., an increase or decrease in funding) to the Baseline FWP; this provides an understanding of the funding level and establishes consequences to outcomes for the Council.

The following assessment framework has been established for this analysis:

TABLE 33: MCA SCORES

Impact	*Symbol*	*Key Factors Assessed*
+ve	🟢	Will result in improvement of criteria
Neutral	🟡	Criteria will remain unchanged
-ve	🔴	Will result in deterioration of criteria

1.5.5 Options assessment

For the MCA, the 2024-27 FWP developed by MDC has been used as the baseline; a list of alternative options has been developed to determine the level of investment required to allow the network to perform adequately. The options are:

'As is' baseline Programme: 2024-27 FWP | This programme focuses on business-as-usual operations and maintenance, cyclic renewals, and rehabilitation, as carried out to date. It assesses critical work generally completed to meet minimum compliance

'Increased' Investment Programme: amends the 'as is' programme by increasing investment | This programme will assess amending the investment upwards to determine the impact on the network

'Reduced' Investment Programme: amends the 'as is' programme by decreasing investment | This programme will assess amending the investment downwards to determine the impact on the network

Where possible, each scenario's investment level has been converted into consequential performance, highlighting the effect of increasing (or decreasing) funding over time (e.g., a 10% increase in funding for structures might equate to maintenance for 20 more assets, and results in the bridge stock being kept in better condition than otherwise).

The summary result of the MCA for each activity (where applicable) is included in the following sections under the relevant Work Categories. MDC's ***Levels of Service Dashboard*** - reflecting the MCA and Council Choice(s) - is shown on the next 2 pages, summarising the impact of selected funding level(s). The full MCA can be found in the Appendices at the rear of this document.

Activity (Work Category)	Funding Level Amendment (A - Increase, B - Retain, C - Decrease)	Change	Performance Metric	Current Performance	Expected Performance	Trend	Risk Profile	2024-27 Cost
WC111 | Sealed pavement maintenance	A	7%	Pavement Integrity Index	98.4%	98.4%		Medium	$ 3,852,718
WC112 | Unsealed pavement maintenance	A	14%	Number of complaints relating to poor surface shape / grading per annum	56	55		Medium	$ 2,854,069
WC113 | Routine drainage maintenance	A	10%	% of assessed network with rutting to LH wheelpath < 20mm depth	95.2%	95.6%		Low-Medium	$ 1,607,184
WC114 | Structures maintenance	C	-4%	Number of reports relating to bridge condition / damage per annum	4	4		Medium	$ 928,143
WC121 | Environmental maintenance	A	8%	Number of complaints relating to vegetation control per annum	31	28		Medium	$ 4,074,779
WC122 | Network service maintenance	A	6%	Number of reports relating to signage condition / damage per annum	139	138		Medium	$ 1,731,565
WC124 | Cycle path maintenance	C	-62%	New asset class installed 2021/22	99.8%	99.1%		Low-Medium	$ 2,858
WC125 | Footpath maintenance	C	-65%	Number of reports relating to footpath condition / damage per annum	37	858		High	$ 77,396
WC140 | Minor events	B	n/c	Number of natural events costing < $100,000 to address per annum	2	2		Medium-High	$ 163,300
WC211 | Unsealed roads metalling	A	16%	Number of complaints relating to slippery surface / metalling per annum	14	14		Medium	$ 965,100
WC212 | Sealed Road Resurfacing	C	-13%	% of assessed network with skid resistance > minimum threshold(s)	96.7%	95.6%		High	$ 9,775,890
WC213 | Drainage renewals	A	12%	% of assets with a condition rating of Average, Good or Excellent	93.1%	93.1%		Low-Medium	$ 1,708,469
WC214 | Sealed road pavement rehabilitation	C	-47%	% of network with travel exposure smoother than defined thresholds	93.5%	89.6%		High	$ 2,411,500
WC215 | Structures component replacements	B	n/c	% of assets with a condition rating of Average, Good or Excellent	89.5%	89.5%		Medium	$ 2,401,579
WC222 | Traffic services renewals	A	11%	% of assets with a condition rating of Average, Good or Excellent	98.7%	98.7%		Low-Medium	$ 1,542,959
WC225 | Footpath renewals	C	-62%	% of assets with a condition rating of Average, Good or Excellent	96.6%	91.1%		Medium-High	$ 64,108

Categories not Subject to Trend Analysis / Performance Metric(s)

Activity (Work Category)	Funding Level Amendment	Change	Performance Metric	Current Performance	Expected Performance	Trend	Risk Profile	2024-27 Cost
WC123 | Network operations	B	n/c	None	-	-		Low-Medium	$ 51,629
WC131 | Rail level crossing warning devices	B	n/c	None	-	-		Medium	$ 47,227
WC151 | Network & asset management	B	n/c	None	-	-		Low-Medium	$ 4,450,573
WC216 | Bridges & structures renewals	C	-100%	None	-	-		High	$ -

Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Oct-22 BERL Cost Adjustment, per annum (Table 6.6, Roading)	5.10%	3.90%	3.20%	2.80%	2.30%	1.90%	1.60%	1.30%	1.00%	0.80%

E-FAR Applied: Y — Inflation figures applied: Y

	2024	2025	2026	+/-
Selected % Change for Maintenance & Operations	10.81	10.81	10.81	-$ 0
Balance Annual Change?	Yes	No		Balanced
Selected % Change for Renewals & Capital	-11.41	-11.41	-11.41	-$ 1
Balance Annual Change?	Yes	No		Overspend
Total, Combined Annual Demand Change	-2.81%	-0.43%	0.64%	-1.45%

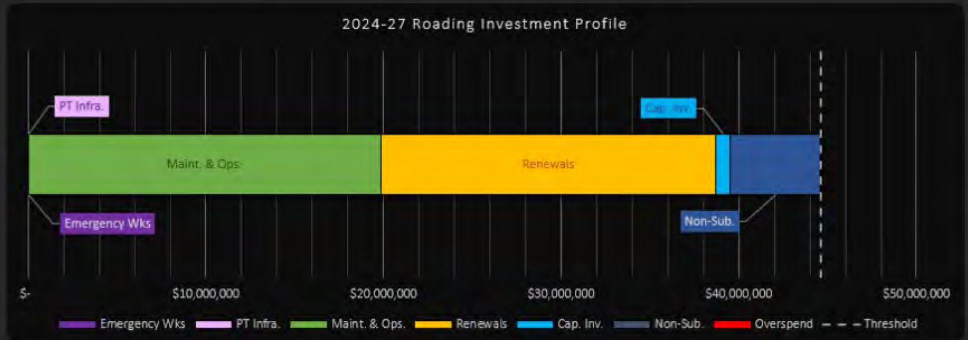
Improvements Programme

Community Requests (New Assets)	
Willoughby St School Parking	
Mt Biggs-Halcombe Rd X'ing facility	
Monteith St F/P (267-330m)	
Te Araroa - Mt Biggs to Te Rakehou	
Te Araroa - Te Rakehou to Beechwood	
Te Araroa - Wilson Rd Hill Section	
Te Araroa - Beechwood to Ranfurly	
Himatangi Crossing Improvements	
Banks Road F/P (0-590m)	$188,643
Watershed Road F/P (2360-3002m)	$306,423

Structures Lifecycle Mgmt & Resilience	
Boness Rd (S13) Guardrail upgrade	
Makino Rd (S121) Guardrail upgrade	
PVE Rd (S189) Guardrail upgrade	
PVE Rd (S198) Guardrail upgrade	
PVE Rd (S199) Guardrail upgrade	
PVE Rd (S201) Guardrail upgrade	
Scour protection (reactive)	
Scour protection PVE Rd (S185)	$109,199
Scour protection PVE Rd (RP 14.386)	$126,120
Scour protection PVE Rd (RP 25.500)	$126,120
Rockfall mitigation Ruahine Rd	$457,886

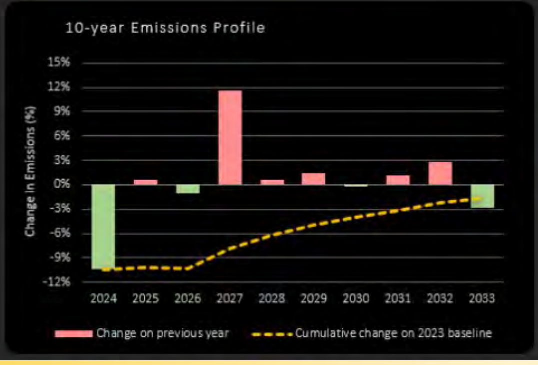
Safety & Efficiency (New Assets)
Awahuri Rd Audio Tactile Pavers
Cemetery Rd Guardrail @ Cemetery
Mangaone Rd PW Signage
Speed Mgmt
Campbell-Taonui Rd Right Turn Bay
Makino Rd C34 Guardrail upgrade
Sandon Rd Guardrails (3No locs)
Pryces Line Guardrails (2No locs)
Intersection Safety Imp. (12No)
PVE Rd PW Signage
Bus Route Signage

Active transport (New Assets)
Barling St F/P (10-321m)
Trent St F/P (262-505m)
Stewart St F/P (6-118m)
Colyton Rd F/P (3725-3835m)
Stewart St F/P (118-288m)
Stewart St F/P (288-663m)



Subsidised Maint, Ops & Investment Mgmt	$ 19,978,440
Subsidised Renewals	$ 18,869,606
Subsidised Capital Investment	$ 819,325
Subsidised PT Infrastructure	$ -
EM Event Response | (76% FAR)	$ -
Non-subsidised Activities	$ 5,133,518

2024-27 Roading Programme (anticipating inflation)	$ 44,800,888
Overall % change for 2024-27 Programme from Previous NLTP	-4.7%
Balanced (Within +/- 0.1%)	-$ 1



MANAWATU DISTRICT COUNCIL

Rural Sealed Road | Longer Term Consequence Scenario

Performance Grade: A B C D E

Urban Road | Longer Term Consequence Scenario

Performance Grade: A B C D E

Structures | Longer Term Consequence Scenario

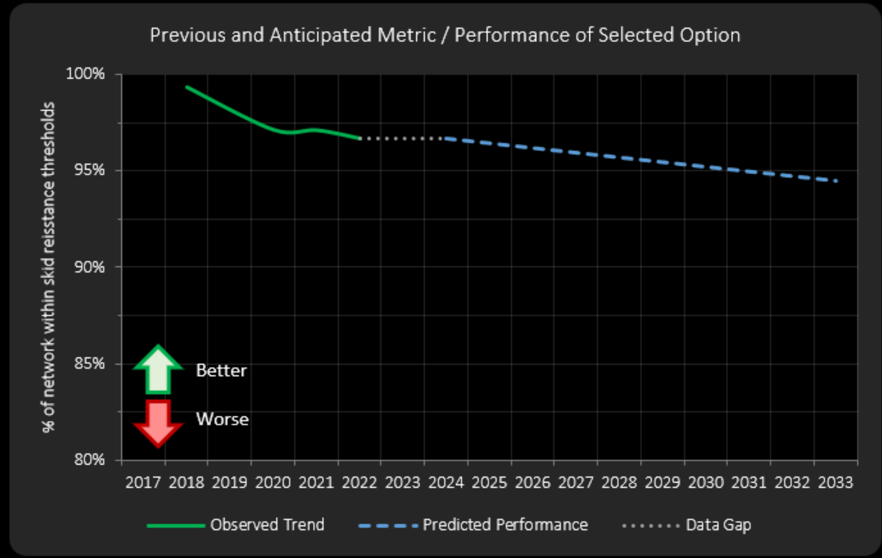
Performance Grade: A B C D E

Unsealed Road | Longer Term Consequence Scenario

Performance Grade: A B C D E

Cost Category	WC212 | Sealed Road Resurfacing	Level of Service	Skid Resistance	Metric	% of assessed network with skid resistance > minimum threshold(s)	Primary Principle	Safety

Cost			Service				Risk	
2024-27 Programme			Service Level Statement		Performance Measure		Performance/reputation risk	
Selection	Quantity (km)	Cost ($)	Grade	Benefit(s) / Consequence(s)	Metric	Target	Score	Rating
	203.501	12,360,321	A	Enhance skid resistance performance, limiting crashes attributable (or partially attributable) to adverse weather	% of assessed network with skid resistance > minimum threshold(s)	97.1%	3.90	Low-Medium
	185.001	11,236,656	B	Maintain skid resistance performance, limiting crashes attributable (or partially attributable) to adverse weather	% of assessed network with skid resistance > minimum threshold(s)	96.7%	9.70	Medium
	160.951	9,775,890	C	Reduced skid resistance likely resulting in more crashes attributable (or partially attributable) to adverse weather	% of assessed network with skid resistance > minimum threshold(s)	95.6%	21.66	High



Base $$	55,725	$/km
Base Quant	61.667	km
Emissions	14.00	tonnes/km

	1 2024	2 2025	3 2026	4 2027	5 2028	6 2029	7 2030	8 2031	9 2032	10 2033	10 Yr Total	Mean
Inflation	5.1%	3.9%	3.2%	2.8%	2.3%	1.9%	1.6%	1.3%	1.0%	0.8%		
Cumulative Inflation	1.051	1.092	1.127	1.158	1.185	1.208	1.227	1.243	1.255	1.265		
Option 1 Grade A | Increase Quantity												
Quantity	67.834	67.834	67.834	67.834	67.834	67.834	67.834	67.834	67.834	67.834	678.34	67.83
Adjusted Budget	3,972,786	4,127,724	4,259,811	4,379,086	4,479,805	4,564,921	4,637,960	4,698,254	4,745,236	4,783,198	44,648,781	4,464,878
Anticipated Performance	96.7%	96.8%	96.9%	97.0%	97.1%	97.2%	97.3%	97.4%	97.5%	97.6%		97.1%
Emissions (tonnes)	949.7	949.7	949.7	949.7	949.7	949.7	949.7	949.7	949.7	949.7	9496.7	949.7
Overall Risk	2	2	2	2	4	4	4	4	6	9		3.90
Likelihood of failure	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Possible	Possible		
Consequence of failure	Negligible	Negligible	Negligible	Negligible	Minor	Minor	Minor	Minor	Minor	Moderate		
Option 2 Grade B | Maintain Quantity												
Quantity	61.667	61.667	61.667	61.667	61.667	61.667	61.667	61.667	61.667	61.667	616.67	61.67
'As Is' Budget	3,611,623	3,752,477	3,872,556	3,980,987	4,072,550	4,149,929	4,216,327	4,271,140	4,313,851	4,348,362	40,589,801	4,058,980
Anticipated Performance	96.7%	96.7%	96.7%	96.7%	96.7%	96.7%	96.7%	96.7%	96.7%	96.7%		96.7%
Emissions (tonnes)	863.3	863.3	863.3	863.3	863.3	863.3	863.3	863.3	863.3	863.3	8633.4	863.3
Overall Risk	2	2	3	9	9	12	12	16	16	16		9.70
Likelihood of failure	Unlikely	Unlikely	Possible	Possible	Possible	Possible	Possible	Probable	Probable	Probable		
Consequence of failure	Negligible	Negligible	Negligible	Moderate	Moderate	Significant	Significant	Significant	Significant	Significant		
Option 3 Grade C | Reduce Quantity												
Quantity	53.650	53.650	53.650	53.650	53.650	53.650	53.650	53.650	53.650	53.650	536.50	53.65
Adjusted Budget	3,142,112	3,264,655	3,369,124	3,463,459	3,543,119	3,610,438	3,668,205	3,715,891	3,753,050	3,783,075	35,313,127	3,531,313
Anticipated Performance	96.7%	96.4%	96.2%	95.9%	95.7%	95.4%	95.2%	94.9%	94.7%	94.5%		95.6%
Emissions (tonnes)	751.1	751.1	751.1	751.1	751.1	751.1	751.1	751.1	751.1	751.1	7511.0	751.1
Overall Risk	6	8	16	16	16	26	33	33	33	33		21.66
Likelihood of failure	Possible	Possible	Probable	Probable	Probable	Probable	Highly Probable	Highly Probable	Highly Probable	Highly Probable		
Consequence of failure	Minor	Minor	Moderate	Moderate	Moderate	Severe	Severe	Severe	Severe	Severe		

Option 1 Grade A | Increase Quantity

10% — slider 0 to 100

Pros | Cons : Enhance skid resistance performance, limiting crashes attributable (or partially attributable) to adverse weather

Option 2 Grade B | Maintain Quantity

0%

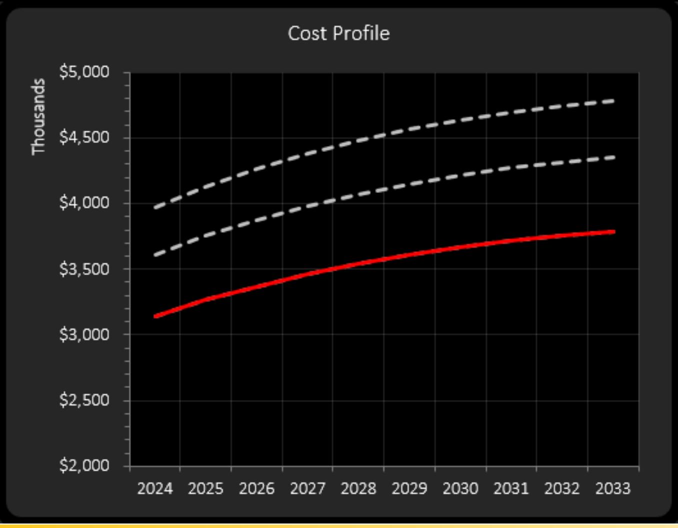
NOTE: Adjust slider to anticpated performance ONLY, based on observed trend

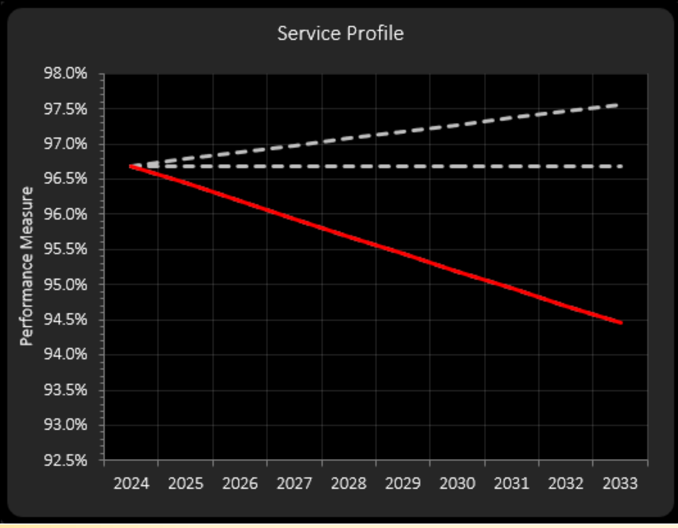
Pros | Cons : Maintain skid resistance performance, limiting crashes attributable (or partially attributable) to adverse weather

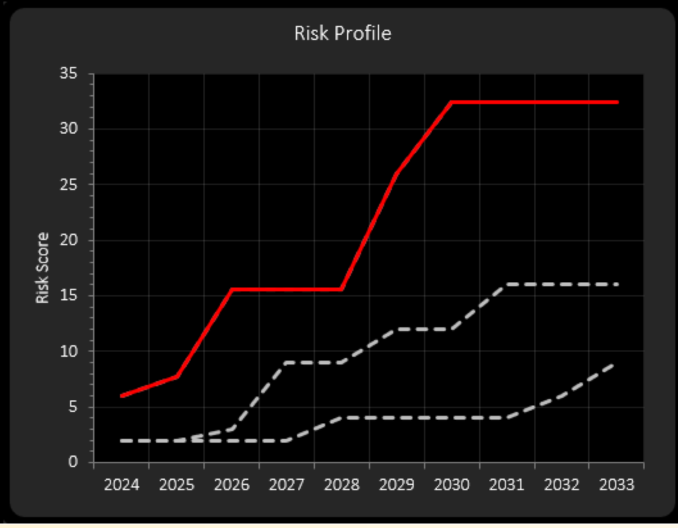
Option 3 Grade C | Reduce Quantity

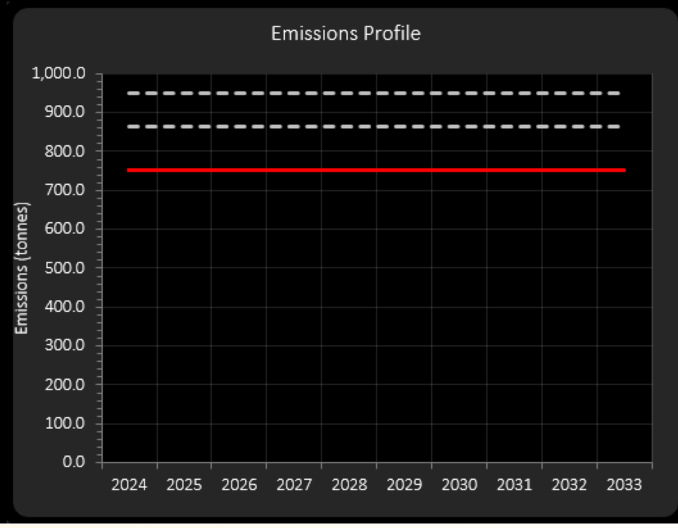
-13% — slider 0 to -100

Pros | Cons : Reduced skid resistance likely resulting in more crashes attributable (or partially attributable) to adverse weather









2.0 Subsidised programme

2.1 Activity class | Investment management

2.1.1 Activity management planning improvement (Work category 003)

This work category provides for the preparation and improvement of land transport AMP's, Speed Management Plans, road safety action plans and procurement strategies

	2024-25	2025-26	2026-27
Activity management planning (AMP) improvement	5,886	22,495	40,119
AMP related programme development	5,886	22,495	40,119
WC 003 Total	11,771	44,990	80,238

2.1.2 Business case development (Work category 004)

This work category provides for the preparation of Business Cases, including supporting evidence collection and model ling.

NZTA expects that proposals for funding assistance for a Business Case will be justified using a fit for purpose Strategic Case which:

- *Outlines the case for change and the need for the potential investment*
- *Identifies the strategic context and fit of the proposed investment*
- *Provides stakeholders with a high degree of confidence that the investment aligns with strategic priorities*

	2024-25	2025-26	2026-27
No business cases anticipated	0	0	0
WC 004 Total	0	0	0

2.1.3 Activity class summary | Investment management

	Work Category Name	2024-25	2025-26	2026-27
003	Investment & AMP management	11,771	44,990	80,238
004	Business case development	0	0	0
Investment Management (Activity Class) - Totals		11,771	44,990	80,238

2.2 Activity class | Local road pothole prevention

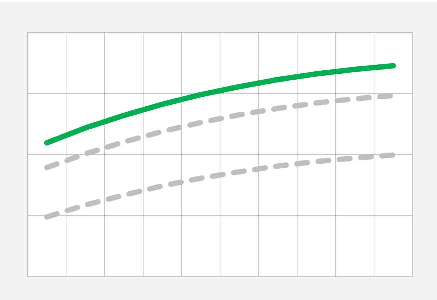
2.2.1 Sealed pavement maintenance (Work category 111)

This work category provides for the routine care of sealed pavements to maintain structural integrity and serviceability of the existing network

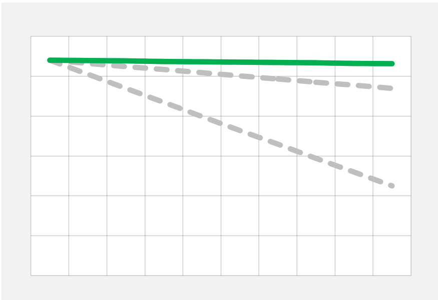
MCA outcomes by investment level:

Asset Group	Funding Level	Asset Quantity	Resilience	Condition	Safety	Customer satisfaction	Service Delivery	Financial Impacts	Overall Impact	Residual Risk
WC111 | Sealed pavement	Increased	$3,852,718								Medium
	'As is'	$3,600,671								
	Reduced	$3,096,577								
Comments	Failure to increase funds to compensate for network deterioration and increasing traffic volumes will result in a poorer road user experience and increased costs to other work activities									

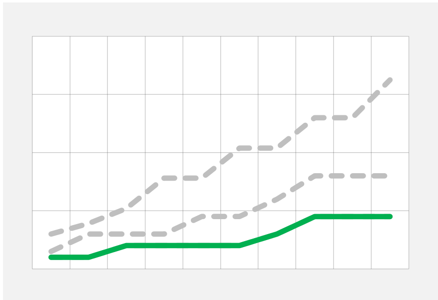
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



	2024-25	2025-26	2026-27
Ordered works	509,173	529,031	545,960
Logging activity mitigation	193,540	201,088	207,522
Pre-Seal Repairs	412,730	428,826	442,549
Lump Sum Activities	122,877	127,669	131,754
WC 111 Total	1,238,319	1,286,614	1,327,785

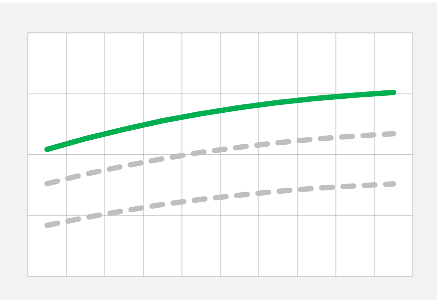
2.2.2 Unsealed pavement maintenance (Work category 112)

This work category provides for the routine care of unsealed pavements to maintain their structural integrity and serviceability of the existing network

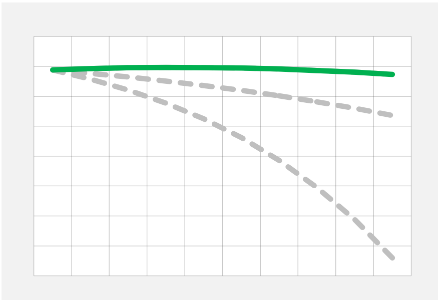
MCA outcomes by investment level:

Asset Group	*Funding Level*	*Asset Quantity*	*Resilience*	*Condition*	*Safety*	*Customer satisfaction*	*Service Delivery*	*Financial Impacts*	*Overall Impact*	*Residual Risk*
WC112 | Unsealed pavement	Increased	$2,854,069								Medium
	'As is'	$2,503,570								
	Reduced	$2,077,963								
Comments	Failure to increase funds to address increasing customer complaints regarding road condition will result in a poorer road user experience and increased costs to other work activities to compensate									

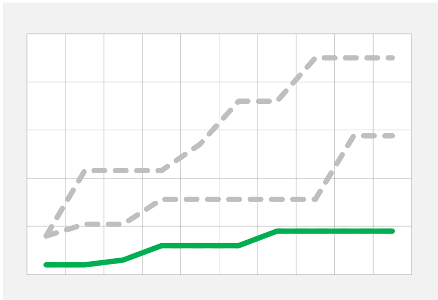
Resultant Cost Profile



Resultant Performance Profile



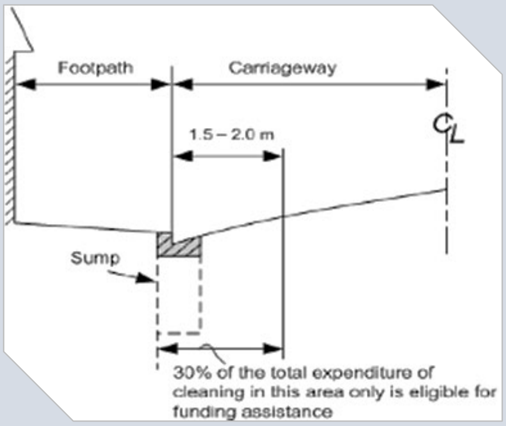
Resultant Risk Profile



	2024-25	2025-26	2026-27
Ordered works	498,702	518,151	534,732
Logging activity mitigation	56,026	58,211	60,073
Lump Sum Activities	362,612	376,754	388,810
WC 112 Total	917,339	953,115	983,615

2.2.3 Routine drainage maintenance (Work category 113)

This work category provides for the routine care of existing drainage facilities to maintain their function



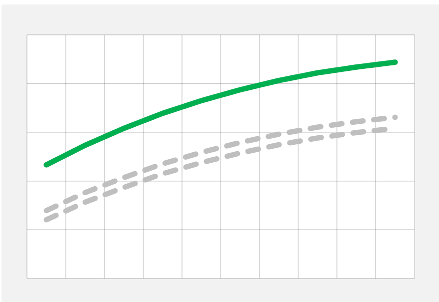
Street Cleaning Activity

NZTA's policy is that funding assistance will be provided for 30% of the total cost of cleaning channels, sumps and cesspits in urban areas; considered as a commensurate benefit to the road and its users

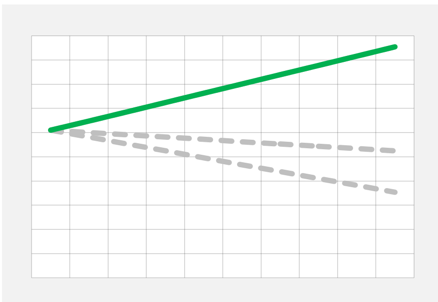
MCA outcomes by investment level:

Asset Group	*Funding Level*	*Asset Quantity*	*Resilience*	*Condition*	*Safety*	*Customer satisfaction*	*Service Delivery*	*Financial Impacts*	*Overall Impact*	*Residual Risk*
WC113 | Routine drainage	Increased	$1,607,184	Amber	Amber	Green	Green	Green	Amber	Amber	Low-Medium
	'As is'	$1,461,076	Amber	Amber	Amber	Amber	Amber	Amber	Amber	
	Reduced	$1,431,855	Red	Red	Amber	Amber	Green	Red	Red	
Comments	Whilst both 'as is' and 'increased' funding levels result in a neutral impact to the network, increasing adverse weather events will demand greater capacity and performance from assets in the future. Increased funds will mitigate this issue more effectively than keeping funding levels as they are									

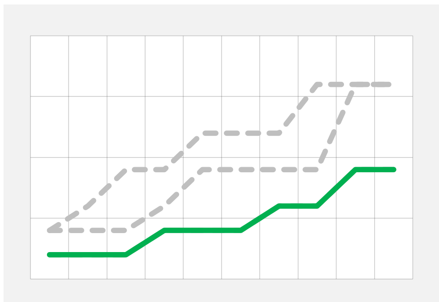
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



	2024-25	2025-26	2026-27
Ordered works	179,830	186,844	192,823
Street Cleaning (attracts lesser 30% financial assistance rate)	82,901	86,134	88,890
Lump Sum Activities	253,841	263,741	272,180
WC 113 Total	516,572	536,718	553,893

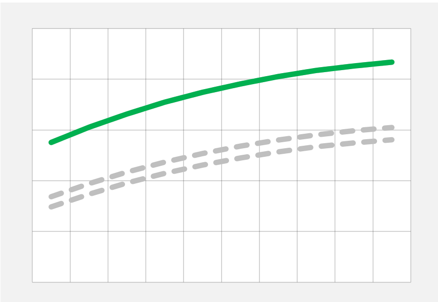
2.2.4 Unsealed road metalling (Work category 211)

This work category provides for the planned periodic renewal of pavement layers, including metal, on unsealed roads

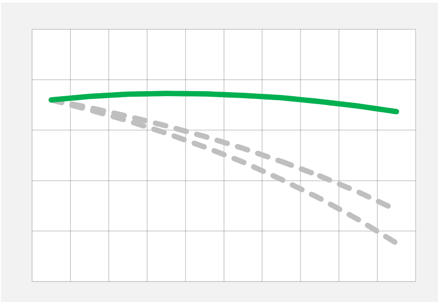
MCA outcomes by investment level:

Asset Group	*Funding Level*	*Asset Quantity*	*Resilience*	*Condition*	*Safety*	*Customer satisfaction*	*Service Delivery*	*Financial Impacts*	*Overall Impact*	*Residual Risk*
WC211 | Unsealed roads metaling	Increased	$965,100	🟢	🟢	🟡	🟡	🟡	🟢	🟡	Medium
	'As is'	$831,983	🟡	🟡	🟡	🟡	🟡	🟡	🟡	
	Reduced	$807,023	🔴	🔴	🔴	🔴	🟡	🔴	🔴	
Comments	Whilst both 'as is' and 'increased' funding levels result in a neutral impact to the network, increasing adverse weather events will demand greater capacity and performance from assets in the future. Increasing funding will mitigate this issue more effectively than keeping funding levels as they are									

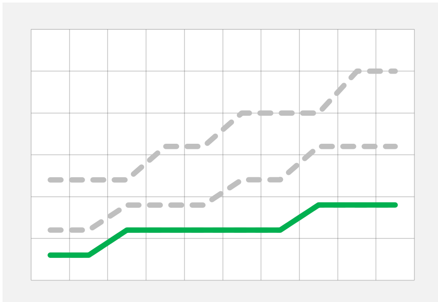
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



	2024-25	2025-26	2026-27
Unsealed roads metalling	310,197	322,295	332,608
WC 211 Total	310,197	322,295	332,608

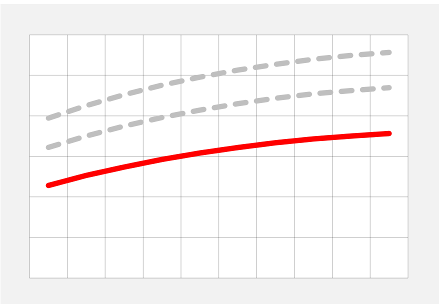
2.2.5 Sealed road resurfacing (Work category 212)

This work category provides for the planned periodic chipsealing (resealing) and Asphaltic Concreting (resurfacing) of sealed roads

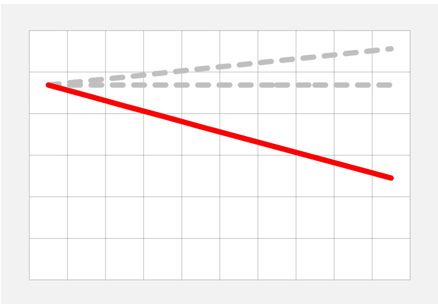
MCA outcomes by investment level:

Asset Group	*Funding Level*	*Asset Quantity*	*Resilience*	*Condition*	*Safety*	*Customer satisfaction*	*Service Delivery*	*Financial Impacts*	*Overall Impact*	*Residual Risk*
WC212 | Sealed road resurfacing	Increased	$12,360,321								
	'As is'	$11,236,656								
	Reduced	$9,775,890								High
Comments	Failure to match fund the new Road Maintenance Contract rates to address deterioration of the sealed network condition will see greater risk imparted to road users and adverse consequences realised, such as suffering more serious and fatal injuries									

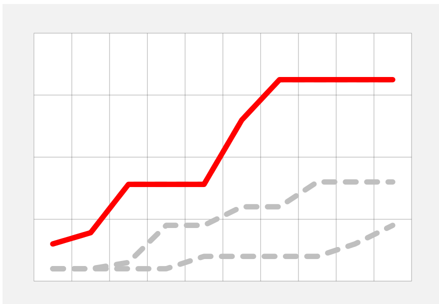
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



	Area (sq.m)	Length (m)	% length	Cost ($)
Chipseal	321,579.7	51,583.6	5.17	2,982,700
AC	2,701.6	231.4	0.02	165,547
2024-25 Totals	324,281.3	51,815.0	5.20	3,148,247

	Area (sq.m)	Length (m)	% length	Cost ($)
Chipseal	341,299.4	55,330.3	5.55	3,137,030
AC	1,921.6	161.7	0.02	121,673
2025-26 Totals	343,221.0	55,492.0	5.57	3,258,703

	Area (sq.m)	Length (m)	% length	Cost ($)
Chipseal	327,908.7	53,435.6	5.36	3,194,366
AC	2,682.4	212.0	0.02	174,573
2026-27 Totals	330,591.1	53,647.6	5.38	3,368,940

Sealed road resurfacing	2024-25	2025-26	2026-27
WC 212 Total	3,148,247	3,258,703	3,368,940

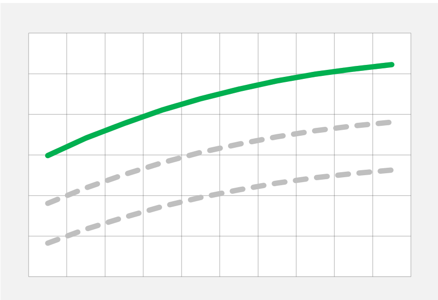
2.2.6 Drainage renewals (Work category 213)

This work category provides for the renewal of drainage facilities that are not routine in nature, but that will reduce future maintenance costs

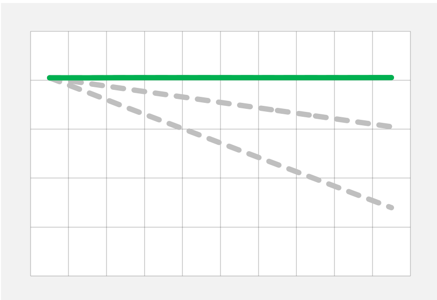
MCA outcomes by investment level:

Asset Group	*Funding Level*	*Asset Quantity*	*Resilience*	*Condition*	*Safety*	*Customer satisfaction*	*Service Delivery*	*Financial Impacts*	*Overall Impact*	*Residual Risk*
WC213 | Drainage renewals	Increased	$1,708,469	🟢	🟢	🟡	🟢	🔴	🟢	🟡	Low-Medium
	'As is'	$1,525,418	🟡	🟡	🟡	🟡	🟡	🔴	🔴	
	Reduced	$1,372,877	🔴	🔴	🟡	🔴	🟢	🔴	🔴	
Comments	Failure to invest in drainage assets to a) compensate for more frequent and severe weather events, and b) replace culverts, etc that have come to the end of their life will cause greater disruption to network access and increased customer dissatisfaction									

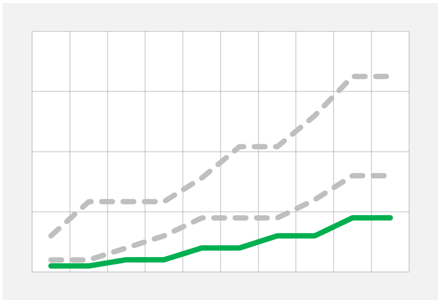
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



	2024-25	2025-26	2026-27
Drainage renewals	549,126	570,542	588,800
WC 213 Total	549,126	570,542	588,800

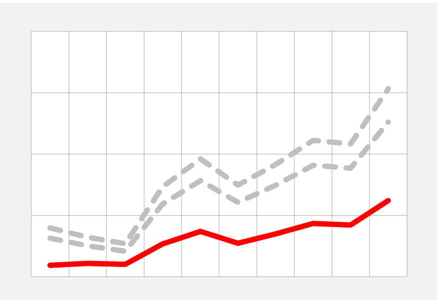
2.2.7 Sealed road pavement rehabilitation (Work category 214)

This work category provides for the replacement of, or restoration of strength to, sealed pavements where other forms of maintenance and renewal are no longer economic

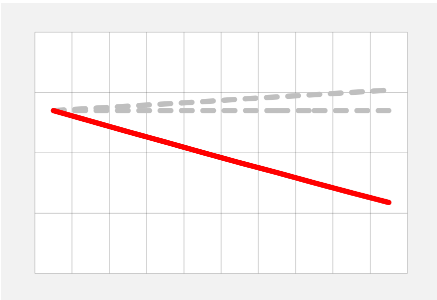
MCA outcomes by investment level:

Asset Group	*Funding Level*	*Asset Quantity*	*Resilience*	*Condition*	*Safety*	*Customer satisfaction*	*Service Delivery*	*Financial Impacts*	*Overall Impact*	*Residual Risk*
WC214 | Sealed road rehabilitation	Increased	$5,147,680								
	'As is'	$4,289,733								
	Reduced	$2,411,500								High
Comments	Failure to match fund the new Road Maintenance Contract rates to address deterioration of the sealed network condition will see greater risk imparted to road users and adverse consequences realised, such as suffering more serious and fatal injuries									

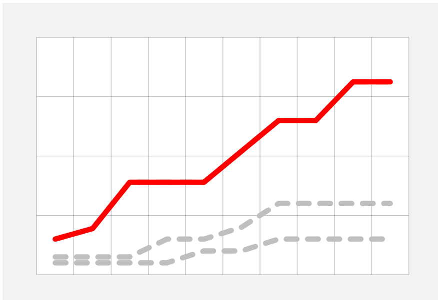
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



	Start	End	Length	Cost ($)
Stewart Road	1.400	2.460	1.060	772,000
2024-25 Totals			1.060	772,000

	Start	End	Length	Cost ($)
McKays Line	0.014	0.242	0.228	113,021
Short Road (Including Awawa Rd Intersection)	0.004	1.442	1.438	719,979
2025-26 Totals			1.666	833,000

	Start	End	Length	Cost ($)
Rangiwahia Road	14.377	14.722	0.345	202,931
Tangimoana Road	9.820	10.182	0.389	287,461
Main Drain Road	8.959	9.524	0.565	316,108
2026-27 Totals			1.299	806,500

Sealed road pavement rehabilitation	2024-25	2025-26	2026-27
WC 214 Total	772,000	833,000	806,500

2.3 Activity class | Local road operations

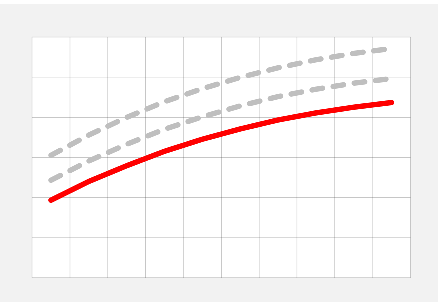
2.3.1 Structures maintenance (Work category 114)

This work category provides for the routine work necessary to maintain the functional, structural integrity and appearance of road bridges, retaining structures, guardrails, stock access structures, cattle stops and footpaths on road structures

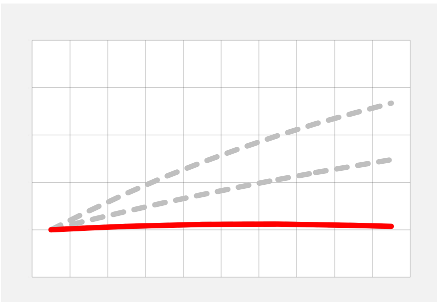
MCA outcomes by investment level:

Asset Group	*Funding Level*	*Asset Quantity*	*Resilience*	*Condition*	*Safety*	*Customer satisfaction*	*Service Delivery*	*Financial Impacts*	*Overall Impact*	*Residual Risk*
WC114 | Structures maintenance	Increased	$1,015,157	🟠	🟢	🟢	🟢	🟢	🟠	🟢	
	'As is'	$966,816	🟠	🟠	🟠	🟠	🟠	🟠	🟠	
	Reduced	$928,143	🟠	🟠	🔴	🟠	🟢	🟠	🟠	Medium
Comments	A reduction in structure maintenance funding from 'as is' is acceptable, given the identified activities in the updated Lifecycle Structures Management Plan (LCMP) for this funding period. This reduction will assist in offsetting more pressing demands from other parts of the network									

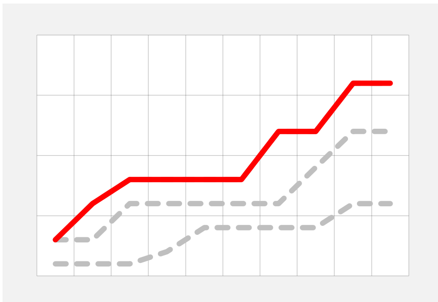
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



	2024-25	2025-26	2026-27
Barrier Maintenance	21,020	21,840	22,539
Concrete Repairs	19,804	20,576	21,234
Miscellaneous	10,510	10,920	11,269
Joint Maintenance	10,510	10,920	11,269
Pavement Repairs	15,765	16,380	16,904
Structure Cleaning	10,510	10,920	11,269
Vegetation Control	15,765	16,380	16,904
Watercourse Clearance	99,845	103,739	107,059
Lump Sum Activities	94,590	98,279	101,424
WC 114 Total	298,319	309,953	319,872

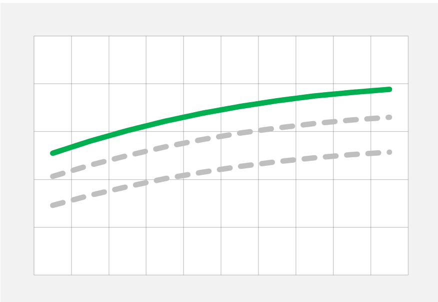
2.3.2 Environmental maintenance (Work category 121)

This work category provides for the routine care and attention of berms, banks, general vegetative matter, trees, and weeds in the road corridor to maintain safety, aesthetic and environmental standards

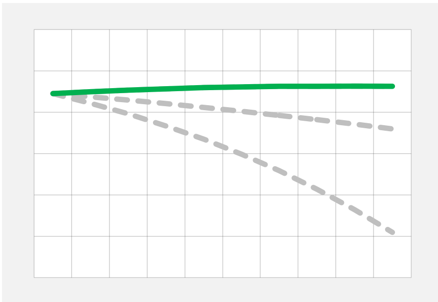
MCA outcomes by investment level:

Asset Group	Funding Level	Asset Quantity	Resilience	Condition	Safety	Customer satisfaction	Service Delivery	Financial Impacts	Overall Impact	Residual Risk
WC121 / Environmental maintenance	Increased	$4,074,779								Medium
	'As is'	$3,772,944								
	Reduced	$3,395,649								
Comments	Failure to increase funds to address increasing customer complaints regarding vegetation and slip management will result in a poorer road user experience and increased costs to other work activities to compensate									

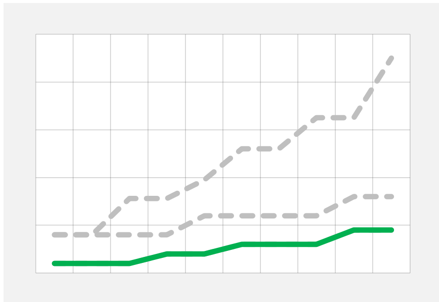
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



	2024-25	2025-26	2026-27
Ordered works	534,564	555,412	573,185
Vegetation control	365,148	379,389	391,529
Lump Sum Activities	409,981	425,970	439,601
WC 121 Total	1,309,693	1,360,771	1,404,315

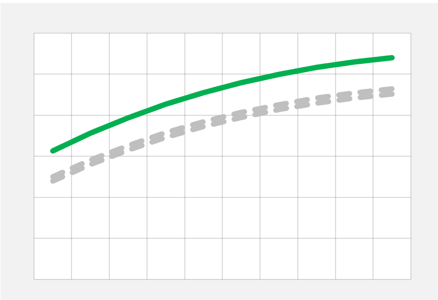
2.3.3 Network service maintenance (Work category 122)

This work category provides for the routine care and attention of road furniture, markings, and carriageway and pedestrian crossing lighting

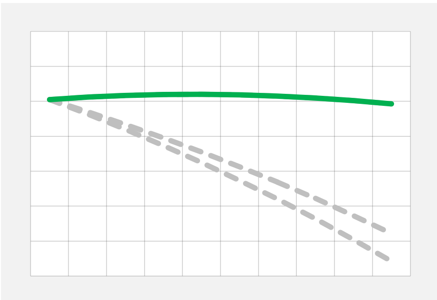
MCA outcomes by investment level:

Asset Group	Funding Level	Asset Quantity	Resilience	Condition	Safety	Customer satisfaction	Service Delivery	Financial Impacts	Overall Impact	Residual Risk
WC122 | Network service maintenance	Increased	$1,731,565								Medium
	'As is'	$1,633,551								
	Reduced	$1,617,216								
Comments	Failure to increase funds to address increasing customer reports of damaged and sub-standard signage condition will result in a poorer road user experience and increased costs to other work activities to compensate									

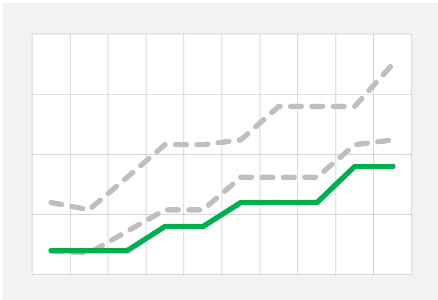
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



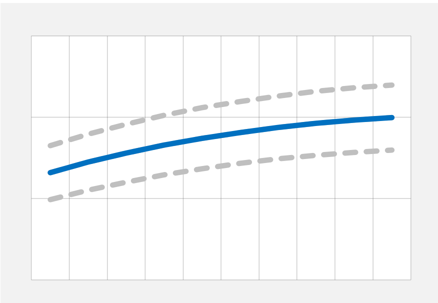
	2024-25	2025-26	2026-27
Ordered works	204,302	212,270	219,063
Traffic services power supply	84,032	87,309	90,103
Lump sum activities	268,216	278,676	287,594
WC 122 Total	556,550	578,255	596,759

2.3.4 Network operations (Work category 123)

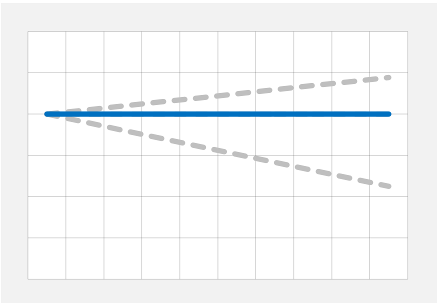
This work category provides for the operation, maintenance and power costs of traffic signals and other traffic management equipment and facilities, including advanced traffic management systems, variable message signs, area-wide traffic control systems (including update of software) or local area traffic management schemes (including speed control devices)

No MCA applied | This is a non-negotiable, core service required to operate associated assets

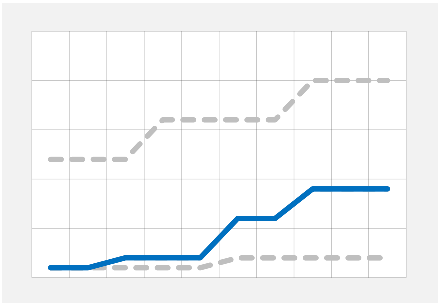
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



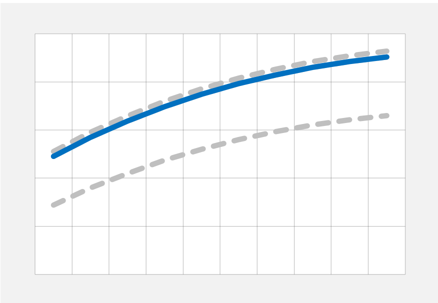
	2024-25	2025-26	2026-27
Network operations	16,594	17,241	17,793
WC 123 Total	16,594	17,241	17,793

2.3.5 Rail level crossing warning devices maintenance (Work category 131)

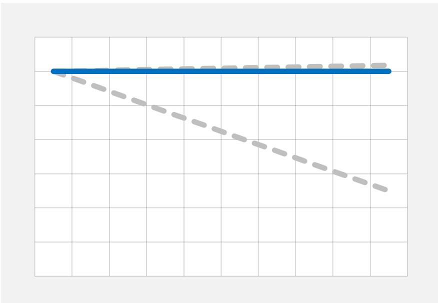
This work category provides for Council to ***share in costs*** *associated with the maintenance and renewal of rail level crossing warning devices,* ***carried out*** *by the relevant rail track authority*

No MCA applied | This is a non-negotiable, externally influenced expenditure

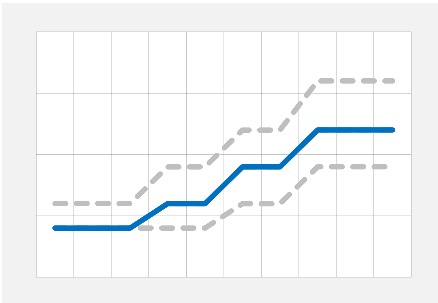
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



	2024-25	2025-26	2026-27
Rail level crossing warning devices	15,180	15,772	16,276
WC 131 Total	15,180	15,772	16,276

2.3.6 Minor events (Work category 140)

This work category enables funding from the National Land Transport Fund (NLTF) for the response to minor, short duration, natural events that reduce service levels on part of the transport network

No MCA applied | This is a nominal anticipated expenditure for unpredictable, minor events

	2024-25	2025-26	2026-27
Minor events	52,487	54,534	56,279
WC 140 Total	52,487	54,534	56,279

2.3.7 Emergency Works (Work category 141)

This work category has been highlighted to ensure that identified remedial activities (i.e. bridge reinstatements) as a result of extreme environmental impact (i.e. earthquake, flood, tsunami, etc) are funded at the appropriate Financial Assistance rate, and for works occurring beyond the Contract year event(s) have taken place

No MCA applied | This is the required expenditure to reinstate assets

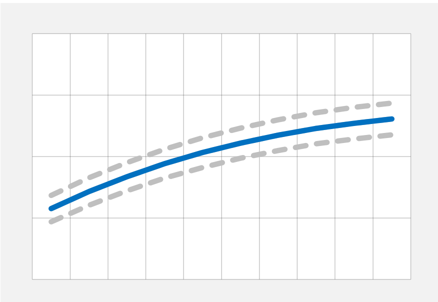
	2024-25	2025-26	2026-27
No outstanding funding requests			
WC 141 Total	0	0	0

2.3.8 Network and asset management (Work category 151)

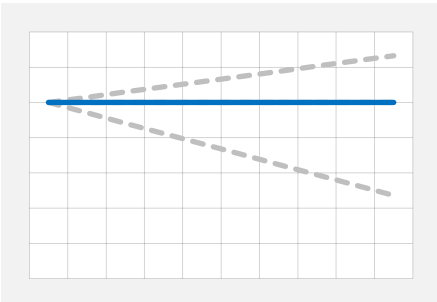
This work category provides for the general management and control of the road network and management of road assets

No MCA applied | This is the required expenditure for managing the network and obtaining the minimum, stipulated data to expected standards

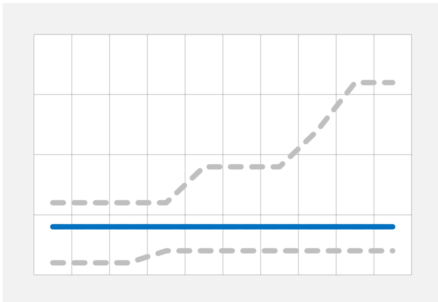
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



	2024-25	2025-26	2026-27
Internal network and asset management	999,570	1,038,553	1,071,787
External Consultants	121,556	126,297	130,338
Data management	125,951	130,863	135,050
Traffic Counting	128,822	133,846	138,129
Contractor (lump sum) network and asset management	54,579	56,708	58,522
WC 151 Total	1,430,478	1,486,267	1,533,827

2.3.9 Structures component replacements (Work category 215)

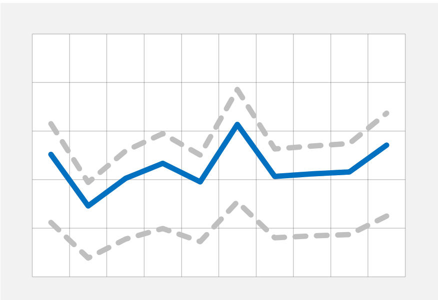
This work category provides for the renewal of components of:

Road bridges, tunnels, retaining structures, guardrails, stock access structures / cattle stops and footpaths (on road structures) & pedestrian over-bridges / underpasses

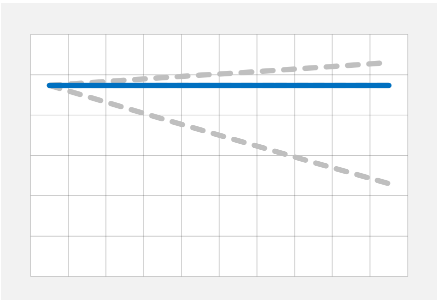
MCA outcomes by investment level:

Asset Group	*Funding Level*	*Asset Quantity*	*Resilience*	*Condition*	*Safety*	*Customer satisfaction*	*Service Delivery*	*Financial Impacts*	*Overall Impact*	*Residual Risk*
WC215 | Structures component replacements	Increased	$2,737,800	●	●	●	●	●	●	●	
	'As is'	$2,401,579	●	●	●	●	●	●	●	Medium
	Reduced	$1,657,090	●	●	●	●	●	●	●	
Comments	Both the 'as is' and 'increased' funding levels score equally. The 'as is' programme will provide the correct level of investment for structural component replacements, as identified in the updated Lifecycle Structures Management Plan (LCMP) for this funding period									

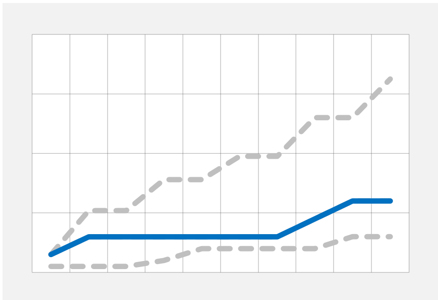
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



	2024-25	2025-26	2026-27
Miscellaneous	31,530		
Joint & Connection Element Refurbishment	399,380		
Sight Rails	1,051		
Delineation Markers	6,832	5,460	5,635
Steel Protection	252,766	626,256	737,803
Inspection Programme	57,805	60,059	61,981
Special Inspections	155,023		
WC 215 Total	904,386	691,775	805,419

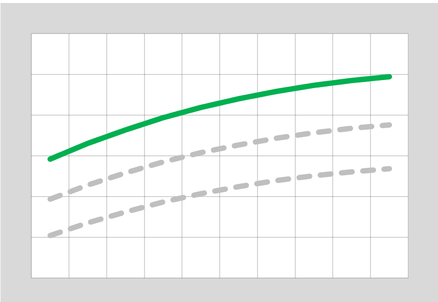
2.3.10 Traffic services renewals (Work category 222)

This work category provides for the renewal of existing road furniture, lighting, signs and markings, traffic management equipment, and facilities

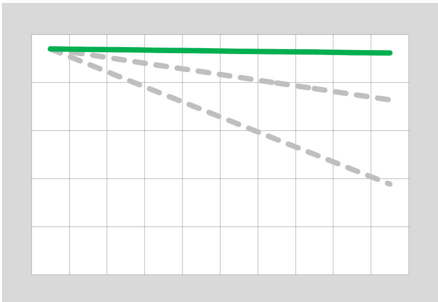
MCA outcomes by investment level:

Asset Group	Funding Level	Asset Quantity	Resilience	Condition	Safety	Customer satisfaction	Service Delivery	Financial Impacts	Overall Impact	Residual Risk
WC222 | Traffic services renewals	Increased	$1,542,959								Low-Medium
	'As is'	$1,390,054								
	Reduced	$1,251,048								
Comments	Traffic Services Renewals provides vital treatments for 3 important safety aspects of the network - signage, lighting and road marking. Failure to increase funds to compensate for higher material costs and deliver this core service will negatively impact on the network									

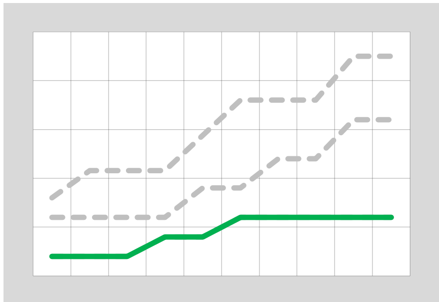
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



	2024-25	2025-26	2026-27
Signage renewals	56,768	58,982	60,870
Streetlight renewals	102,841	106,852	110,271
Road-marking renewals	336,320	349,436	360,618
WC 222 Total	495,929	515,271	531,759

This programme is required to maintain fit-for-purpose road-marking, signage and lighting assets in accordance with the Road and Traffic Standards (RTS), Manual of Traffic Signs and Markings (MoTSaM) and Traffic Control Devices (TCD) manuals

2.4 Activity class | Local road improvements

2.4.1 Bridges and structures renewals (Work category 216)

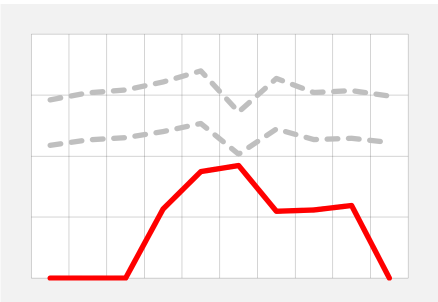
This work category provides for the renewal of bridges and structures on a 'like-for-like' basis, as opposed to provision of new - or upgrading of existing - assets (covered under Work Category 322: Replacement of bridges and structures)

The Structures Renewal Programme has been deferred for this funding period to mitigate Maintenance, Operations, and Renewals budget constraints

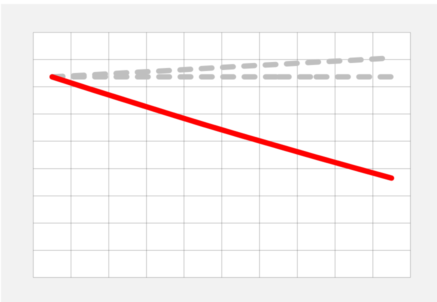
MCA outcomes by investment level:

Asset Group	*Funding Level*	*Asset Quantity*	*Resilience*	*Condition*	*Safety*	*Customer satisfaction*	*Service Delivery*	*Financial Impacts*	*Overall Impact*	*Residual Risk*
WC216 | Bridge and structure renewals	Increased	$9,040,938	🟢	🟢	🟢	🟡	🔴	🟡	🟡	
	'As is'	$6,746,969	🟡	🟢	🟢	🟡	🟡	🟢	🟡	
	Reduced	$0	🔴	🟡	🔴	🔴	🟢	🟡	🔴	High
Comments	Whilst both the 'as is' and 'increased' funding levels result in neutral impact to the network as this time, the 'as is 'programme will provide the correct level of investment for bridge renewals, as identified in the updated Lifecycle Structures Management Plan (LCMP) for this funding period									

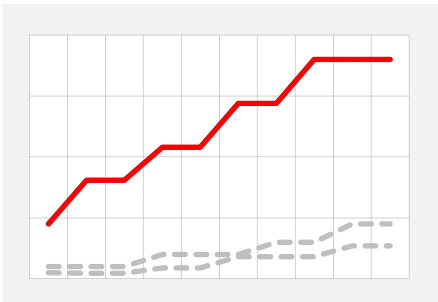
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



	RP	ID	Description	2024-25	2025-26	2026-27
No structures renewals						
WC 216 Total				0	0	0

Examples of qualifying activities include, but may not be limited to:

- *Replacing a structurally inadequate bridge*
- *Replacing retaining structures, including sea walls, that support a road*
- *Replacing (major) culverts having a minimum cross-sectional area of 3.4 square meters*

2.4.2 Replacement of bridges and structures (Work category 322)

This work category provides for new or upgrading bridges and other road structures, where this is the main purpose of the work.

Replacement of assets on a 'like-for-like' basis is covered under Work Category 216: Bridges and structures renewals

No new or upgraded structures programmed for this funding period

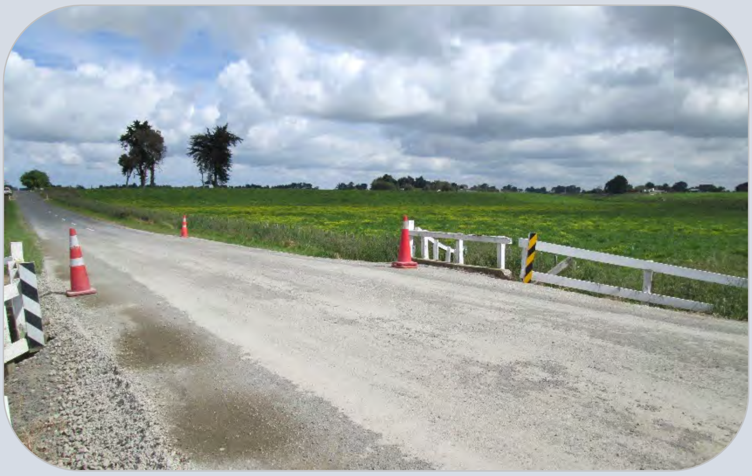
	RP	ID	Description	2024-25	2025-26	2026-27
No upgraded structures						
No new structures						
WC 322 Total				0	0	0

Examples of qualifying activities include, but may not be limited to:

- *Modifying an existing bridge to increase its structural capacity to a level higher than originally provided*
- *Widening an existing bridge*
- *Sealing bridge approaches on unsealed roads*

2.4.3 Road improvements (Work category 324)

This work category provides for improvements to or upgrading of existing roads within the existing or widened road reserve, and deviations onto a new road reserve, where the original road is closed, including any associated new road structures



Road Improvement programme has been deferred to concentrate on maintaining the existing network

	Start	End	Description	2024-25	2025-26	2026-27
No road Improvements						
WC 324 Total				0	0	0

Examples of qualifying activities include, but may not be limited to:

- *Road realignment, re-grading or widening, including seal widening*
- *Improvements to intersections*
- *Passing lanes or slow vehicle bays*
- *Safe system infrastructure, such as median and side barriers, roundabouts and speed management devices*
- *Approaches to bridge replacements costing in excess of $50,000*
- *Retaining structures, culverts and replacement cattle stop*
- *Stock underpasses*
- *All traffic signs, pavement markings, traffic signals, lighting (including under-grounding), etc, necessary to bring the improved facility into service*
- *Reinstatement of footpaths and vehicular crossings that are part of the improvement project*

2.4.4 Seal extension (Work category 325)

This work category provides for the sealing of existing unsealed roads

No seal extensions programmed for this funding period

	Start	End	Length	Description	2024-25	2025-26	2026-27
No seal extensions							
WC 325 Total					0	0	0

Examples of qualifying activities include, but may not be limited to:

- *Extending the length of sealing from a sealed onto an unsealed road*
- *Road improvements as defined in Work Category 324: Road improvements*

Exclusions are:

- *Widening the seal of an existing sealed road | this is funded under Work Category 324: Road improvements*
- *A new cattle stop where there was none previously*

2.4.5 Low cost, low risk roading improvements (Work category 341)

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. Candidate projects will be advanced if they are affordable and economically justified

PROGRAMME DECLINED by NZTA

MCA outcomes by investment level:

Asset Group	*Programme*	*Asset Quantity*	*Resilience*	*Condition*	*Safety*	*Customer satisfaction*	*Service Delivery*	*Financial Impacts*	*Overall Impact*	*Selected Option*
WC341 | Low Cost - Low Risk	Full	$2,346,305	Amber	Green	Green	Amber	Green	Green	Green	
	Moderated	$1,751,860	Amber	Green	Green	Amber	Amber	Amber	Amber	
	None	$0	Red	Amber	Red	Red	Amber	Red	Red	⇦
Comments	By concentrating on a) maintaining the existing core network performance (through maintenance and renewals), and b) focussing on Issue 3 (safety) the proposed programme was recommended, but declined									

	Start	End	Description	2024-25	2025-26	2026-27
Bridge Related Safety Improvements						
Boness Road	0.245	-	S13 Bridge Guardrail	~~78,825~~		
Makino Road	7.230	-	S121 Bridge Guardrail	~~63,060~~		
Pohangina Valley East Road	3.139	-	S189 Bridge Guardrail			~~39,443~~
Pohangina Valley East Road	14.373	-	S198 Bridge Guardrail			~~84,520~~
Pohangina Valley East Road	15.486	-	S199 Bridge Guardrail			~~84,520~~
Pohangina Valley East Road	17.423	-	S201 Bridge Guardrail			~~84,520~~
			Sub-total	0	0	0
Safer Journeys for Schools						
Feilding, Kimbolton, Apiti	Var	-	Bus Route Signage	~~16,163~~		
Mt Biggs Rd-Halcombe Rd	10.482	-	Crossing Facility		~~54,599~~	
			Sub-total	0	0	0
Road Corridor & Intersection Safety						
Pohangina Valley East Road	0.000	45.600	PW Signage	~~78,825~~	~~81,899~~	~~84,520~~
Mangaone Road	0.000	8.450	PW Signage	~~14,714~~		

Awahuri Feilding Road	3.450	5.100	Audio Tactile Pavers	~~42,040~~		
Rongotea-Aranui Intersection	14.184	-	Signage Upgrade	~~5,255~~		
Taipo-Waitohi Intersection	0.000	-	Signage Upgrade	~~5,255~~		
Tangimoana-Campion Int.	11.083	-	Signage Upgrade	~~5,255~~		
Rongotea-Cole Intersection	7.385	-	Signage Upgrade	~~5,255~~		
Rongotea-Oroua Intersection	11.944	-	Signage Upgrade		~~5,460~~	
Wilson-Ngaio Intersection	4.046	-	Signage Upgrade		~~5,460~~	
Colyton-Watershed Int.	11.235	-	Signage Upgrade		~~5,460~~	
Taonui-Reid Line East Int.	3.466	-	Signage Upgrade		~~5,460~~	
Makino Road	8.530	8.590	Culvert C34 Guardrail		~~54,599~~	
Sandon Road	0.550	0.710	Roadside Barrier	~~175,167~~		
Sandon Road	3.030	3.235	Roadside Barrier		~~181,998~~	
Sandon Road	5.600	5.750	Roadside Barrier			~~187,822~~
Pryces Line	6.500	6.610	Roadside Barrier		~~65,519~~	
Pryces Line	7.350	7.500	Roadside Barrier		~~98,279~~	
Kaimatarau-Kellow Int.	2.036	-	Signage Upgrade			~~5,635~~
Tangimoana-Rosina Int.	14.761	-	Signage Upgrade			~~5,635~~
Rongotea-Hammond Int.	2.586	-	Signage Upgrade			~~5,635~~
Milner-Kellow Intersection	2.436	-	Signage Upgrade			~~5,635~~
			Sub-total	0	0	0
Speed Management						
Halcombe	-	-	Speed Management Plan	~~18,393~~		
Sanson	-	-	Speed Management Plan	~~7,883~~		
Apiti	-	-	Speed Management Plan	~~2,943~~		
Kimbolton	-	-	Speed Management Plan	~~4,730~~		
Hiwinui	-	-	Speed Management Plan	~~3,153~~		
Rangiwahia	-	-	Speed Management Plan		~~2,184~~	
Waituna West	-	-	Speed Management Plan		~~1,638~~	
Pohangina	-	-	Speed Management Plan		~~5,023~~	
Rongotea	-	-	Speed Management Plan		~~12,558~~	
Tangimoana	-	-	Speed Management Plan		~~3,276~~	
Himatangi Beach	-	-	Speed Management Plan		~~5,460~~	
Himatangi Block Road	0.040	1.475	Speed Management Plan		~~4,204~~	
Wylie Road	0.040	0.783	Speed Management Plan		~~4,204~~	
Feilding CBD	-	-	Speed Management Plan			~~39,781~~
			Sub-total	0	0	0
WC 341 Total				0	0	0

2.4.6 Resilience improvements (Work category 357)

This work category provides for non-routine work to protect the following from damage: Roads, structures, and eligible walking and/or cycling facilities.

This category also provides for non-routine work to minimise the threat of road closure from natural phenomena

MCA outcomes by investment level:

Asset Group	Programme	Asset Quantity	Resilience	Condition	Safety	Customer satisfaction	Service Delivery	Financial Impacts	Overall Impact	Selected Option
WC357 | Resilience improvements	Full	$917,749	●	●	●	●	●	●	●	
	Moderated	$752,710	●	●	●	●	●	●	●	⇦
	None	$0	●	●	●	●	●	●	●	
Comments	By concentrating on a) maintaining the existing core network performance, and b) foccusing on issue 2 (resilience) the full proposed programme was recommended but declined- HOWEVER, the most of the programme has obtained funding via the Crown Resilience Fund									

	ID / RP	Description	2024-25	2025-26	2026-27
Pohangina Valley East Road	S185	Scour protection (bridge)		109,199	
Pohangina Valley East Road	14.386	Scour protection (road)	126,120		
Pohangina Valley East Road	25.500	Scour protection (road)	126,120		
Ruahine Road	Var	Rockfall retention / prevention		225,337	232,548
Minor Resilience Works	Var	Reactive protection programme	~~31,635~~	~~32,869~~	~~33,921~~
WC 357 Total			252,240	334,536	232,548

Examples of qualifying activities include:

- *New works to protect existing roads from sea or river damage*
- *New drainage for incipient slips or toe-weighting of unstable slopes*
- *Protection planting designed to arrest the slumping or displacement of a road platform*
- *Work to overcome changes in a river's course or bed level that threaten roads, bridges or other road-related structures, but which is not attributable to one climatic event*

2.5 Activity class | Walking and cycling improvements

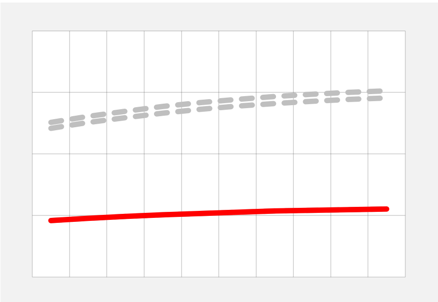
2.5.1 Cycle path maintenance (Work category 124)

This work category provides for the operation and maintenance of the pavement and facilities associated with cycle paths, including the operation of associated lighting. This includes cycle and combined walk-cycle paths and facilities, provided the facilities are consistent with a relevant cycling or walking and cycling strategy or plan

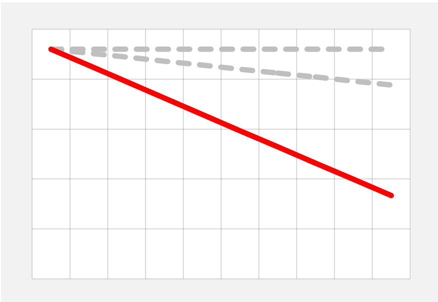
PROGRAMME SEVERELY REDUCED by 65%

No MCA applied | This is a nominal expenditure for minimal defects to newly installed assets

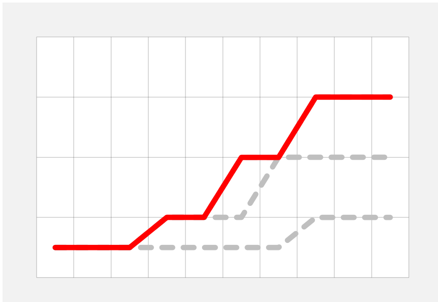
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



	2024-25	2025-26	2026-27
Cycle path maintenance	919	954	985
WC 124 Total	919	954	985

Exclusions are:

- *Cycle paths and facilities used for purely recreational purposes | these are not eligible for funding assistance*
- *Pedestrian only walk paths and facilities | these are funded under Work category 125: Footpath maintenance*
- *Construction/implementation of new cycle facilities or capital work on existing facilities, such as the provision of new lighting | these are funded under Work category 452: Cycle facilities*

2.5.2 Footpath maintenance (Work category 125)

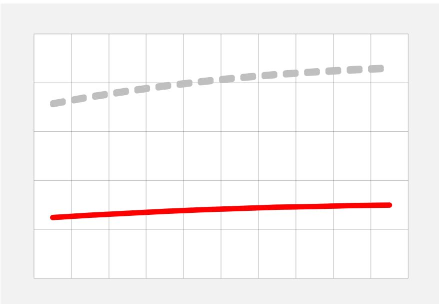
This work category provides for the operation, maintenance and renewal of the pavement and facilities associated with footpaths, including the operation of associated lighting. This includes footpaths and facilities, provided the facilities are consistent with a relevant walking strategy or plan

PROGRAMME SEVERELY REDUCED by 65%

MCA outcomes by investment level:

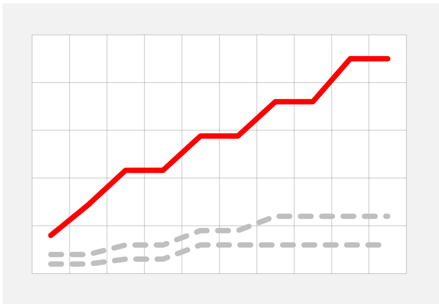
Asset Group	Funding Level	Asset Quantity	Resilience	Condition	Safety	Customer satisfaction	Service Delivery	Financial Impacts	Overall Impact	Residual Risk
WC125 | Footpath maintenance	Increased	$223,343	🟡	🟢	🟡	🟡	🟡	🟡	🟡	
	'As is'	$221,132	🟡	🟡	🔴	🟡	🟡	🟡	🔴	
	Reduced	$77,396	🟡	🔴	🔴	🔴	🟢	🔴	🔴	High
Comments	A minor increase in funding level above 'as is' would have maintained the network condition and customer satisfaction more effectively, given the high profile that defects to the walking network garner from path users; programme severely curtailed									

Resultant Cost Profile



Resultant Performance Profile

Resultant Risk Profile



	2024-25	2025-26	2026-27
Footpath maintenance	24,876	25,846	26,673
WC 125 Total	24,876	25,846	26,673

Exclusions are:

- *Footpaths and facilities used for recreational purposes (e.g., paths which do not connect to the wider network)*
- *Footpaths and facilities that are not in public ownership or to which the public does not have full access at all times*
- *Maintenance of shared pedestrian cycling paths and facilities*
- *Vegetation control, mowing of berms & sweeping | this is funded under WC 121: Environmental maintenance*
- *Construction/implementation of new or improved shared pedestrian and cycle paths and walking facilities*

2.5.3 Footpath renewals (Work category 225)

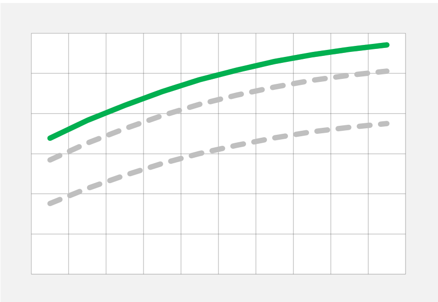
This work category provides for the renewal of the pavement and facilities associated with footpaths

PROGRAMME SEVERELY REDUCED by 60%

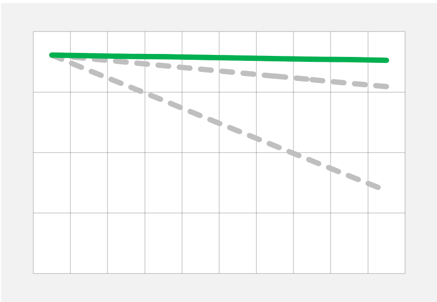
MCA outcomes by investment level:

Asset Group	*Funding Level*	*Asset Quantity*	*Resilience*	*Condition*	*Safety*	*Customer satisfaction*	*Service Delivery*	*Financial Impacts*	*Overall Impact*	*Residual Risk*
WC225 | Footpath renewals	Increased	$177,140	🟡	🟡	🟢	🟡	🟢	🟡	🟡	
	'As is'	$168,705	🟡	🟡	🟢	🟡	🟡	🟡	🟡	
	Reduced	$64,108	🟡	🟡	🟢	🔴	🟢	🟡	🟡	Medium-High
Comments	An increase in funding level above 'as is' would have aided in maintaining network condition and customer satisfaction more effectively, given the high profile that defects to the walking network garner from path users; programme severely curtailed									

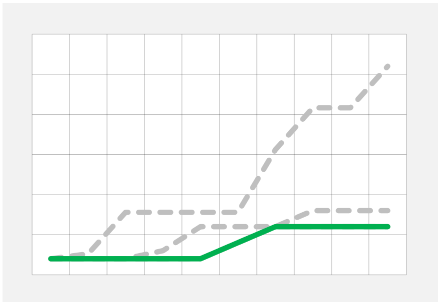
Resultant Cost Profile



Resultant Performance Profile



Resultant Risk Profile



	2024-25	2025-26	2026-27
Footpath renewals	20,605	21,409	22,094
WC 125 Total	20,605	21,409	22,094

Exclusions are:

- *Footpaths and facilities used for recreational purposes (e.g., paths which do not connect to the wider network)*
- *Footpaths and facilities that are not in public ownership or to which the public does not have full access at all times of the day, e.g., footpaths in parks that are closed to the public at night*
- *Renewal of assets | these are funded under Work category 224*
- *Construction/implementation of new or improved facilities | these are funded under Work category 451*

2.5.4 Walking facilities (Work category 451)

This work category provides for the construction/implementation of new or improved walking facilities

PROGRAMME DECLINED by NZTA

MCA outcomes by investment level:

Asset Group	Programme	Asset Quantity	Resilience	Condition	Safety	Customer satisfaction	Service Delivery	Financial Impacts	Overall Impact	Selected Option
WC451 / Walking Improvements	Full	$1,055,551	🟡	🟢	🟢	🟢	🟢	🔴	🟡	
	Moderated	$840,256	🟡	🟢	🟢	🟡	🟡	🟡	🟡	
	None	$0	🟡	🟡	🔴	🔴	🟡	🟢	🔴	⇦
Comments	New footpaths had been prioritised to complement forthcoming (substantial) subdivision developments) and continuation of projects identified under to Council's Walking and Cycling Strategy, but declined									

	Start	End	Description	2024-25	2025-26	2026-27
Barling Street	0.010	0.321	New path	~~194,687~~		
Trent Street	0.262	0.505	New path	~~129,538~~		
Colyton Road	3.565	3.725	New path		~~370,822~~	
Stewart Street	0.006	0.118	New path		~~55,730~~	
Monteith Street	0.267	0.330	New path			~~89,480~~
WC 451 Total				0	0	0

Examples of qualifying activities may include:

- *New or improved footpaths to existing bridges, new overbridges/underpasses, and railway crossings*
- *Pedestrian crossing features, and shelters (excluding shelters that are primarily provided for passenger transport)*
- *All markings, traffic signals, signage, lighting, etc. necessary to bring the facility into service*

2.5.5 Cycling facilities (Work category 452)

This work category provides for the construction / implementation of new or improved cycle facilities, and shared pedestrian and cycle paths. Interventions required to improve the safety and amenity value of cycling, for example a wider carriageway, vehicle parking configurations, pinch points or kerb structure is eligible for funding assistance

MCA outcomes by investment level:

Asset Group	Programme	Asset Quantity	Resilience	Condition	Safety	Customer satisfaction	Service Delivery	Financial Impacts	Overall Impact	Selected Option
WC452 | Cycling Improvements	Full	$4,116,262								
	Moderated	$1,646,505								
	None	$0								⇦
Comments	Focus on the Te Araroa Trail had been prioritised by Council Members for inclusion; however, the updated GPS has severely curtailed active transport mode investment, now focussing on Road Maintenance and Resilience. Programme suspended and funding reallocated to WC's 212, 214 and 357									

	Start	End	Length	2024-25	2025-26	2026-27
No Shared Paths / Trails programmed						
WC 452 Total				0	0	0

Examples of qualifying activities include, but may not be limited to:

- *Shared pedestrian and cycle paths, bicycle parking/racks, kerb crossings, signage, new or improved cycle lanes, including on existing bridges, and separated cycle paths*

This work category excludes mountain biking trails and/or facilities not made available to the general public at all times

2.5.6 Activity class summary | Walking and cycling improvements

	Work Category	2024-25	2025-26	2026-27
124	Cyclepath maintenance	919	919	919
125	Footpath maintenance	24,876	24,876	24,876
225	Footpath renewals	20,605	21,409	22,094
451	New walking facilities	0	0	0
452	New cycling / shared path facilities	0	0	0
Walking and Cycling Improvements (Activity Class) - Totals		46,400	47,204	47,889

2.6 Activity class | Public transport infrastructure

2.6.1 Public transport facilities operations and maintenance (Work category 514)

This work category provides for the management, operation and maintenance of off-vehicle facilities and equipment associated with the delivery of public transport services separately identified by mode or for multi-modal use

An example of qualifying activity includes the maintenance and general security of public transport facilities and infrastructure, including bus stops.

A nominal allowance has been made for the maintenance upkeep of bus shelters in the Manawatū district

Asset Group	*Funding Level*	*Asset Quantity*	*Resilience*	*Condition*	*Safety*	*Customer satisfaction*	*Service Delivery*	*Financial Impacts*	*Overall Impact*	*Selected Option*
WC514 | Public transport facilities O and M	Increased	$19,783	🟡	🟡	🟡	🟢	🟡	🟡	🟡	
	'As is'	$17,985	🟡	🟡	🟡	🟡	🟡	🟡	🟡	
	Reduced	$0	🟡	🔴	🔴	🔴	🟢	🟡	🔴	⇦
Comments	Both the 'as is' and 'increased' funding levels result in a neutral impact on network performance. There is limited benefit in enhancing the programme at this time, but this programme has been declined									

	Work Category Name	2024-25	2025-26	2026-27
514	Public transport facilities O & M	~~5,781~~	~~6,006~~	~~6,198~~
Public Transport Facilities O & M (Activity Class) - Totals		0	0	0

2.7 Subsidised investment summary

2.7.1 Local road operations, pothole prevention & investment management

	Work Category	2024-25	2025-26	2026-27	Total 2024-27	Total 2021-24	Diff	%
003	Investment & AMP management	11,771	44,990	80,238	136,999	154,953	-17,954	-11.6
004	Business case development	0	0	0	0	154,953	-154,953	-100.0
Investment Management		11,771	44,990	80,238	136,999	309,906	-172,907	-55.8
114	Structures Maintenance	298,319	309,953	319,872	928,143	917,889	10,254	1.1
121	Environmental Maintenance	1,309,693	1,360,771	1,404,315	4,074,779	3,531,191	543,588	15.4
122	Network Service Maintenance	556,550	578,255	596,759	1,731,565	1,469,512	262,053	17.8
123	Network Operations	16,594	17,241	17,793	51,629	39,735	11,894	29.9
131	Rail Level Crossing Warning Devices	15,180	15,772	16,276	47,227	43,329	3,898	9.0
140	Minor Events	52,487	54,534	56,279	163,300	146,900	16,400	11.2
151	Network & Asset Management	1,430,478	1,486,267	1,533,827	4,450,573	3,607,531	843,042	23.4
215	Structures Component Replacements	904,386	691,775	805,419	2,401,579	1,297,819	1,103,760	85.0
222	Traffic Services Renewals	495,929	515,271	531,759	1,542,959	1,132,464	410,495	36.2
Local Road Operations		5,079,615	5,029,839	5,282,300	15,391,754	12,186,371	3,205,383	26.3
211	Unsealed Roads Metalling	310,197	322,295	332,608	965,100	748,436	216,664	28.9
111	Sealed Pavement Maintenance	1,238,319	1,286,614	1,327,785	3,852,718	3,239,097	613,621	18.9
112	Unsealed Pavement Maintenance	917,339	953,115	983,615	2,854,069	2,252,164	601,905	26.7
113	Routine Drainage Maintenance	516,572	536,718	553,893	1,607,184	1,367,457	239,727	17.5
212	Sealed Roads Resurfacing	3,148,247	3,258,703	3,368,940	9,775,890	6,544,062	3,231,828	49.4
213	Drainage Renewals	549,126	570,542	588,800	1,708,469	1,423,086	285,383	20.1
214	Sealed Road Pavement Rehabilitation	772,000	833,000	806,500	2,411,500	3,063,439	-651,939	-21.3
Local Road Pothole Prevention		7,451,802	7,760,987	7,962,141	23,174,930	18,637,741	4,537,189	24.3
Total		12,543,188	12,835,816	13,324,679	38,703,683	31,134,018	7,569,666	24.3

2.7.2 Local road improvements & walking and cycling improvements

		2024-25	2025-26	2026-27	Total 2024-27	Total 2021-24	Change	%
216	Bridges & Structures Renewals	0	0	0	0	1,482,686	-1,482,686	-100.0
322	Replacement of bridges and structures	0	0	0	0	511,707	-511,707	-100.0
324	Road improvements	0	0	0	0	2,359,034	-2,359,034	-100.0
325	Seal extensions	0	0	0	0	747,789	-747,789	-100.0
341	Low cost, low risk improvements	0	0	0	0	2,306,756	-2,306,756	-100.0
357	Resilience improvements	252,240	334,536	232,548	819,325	178,254	641,071	359.6
Local Road Improvements		252,240	334,536	232,548	819,325	6,103,539	-5,284,214	-86.6
124	Cycle Path Maintenance	919	954	985	2,858	7,651	-4,793	-62.6
125	Footpath Maintenance	24,876	25,846	26,673	77,396	198,926	-121,530	-61.1
225	Footpath Renewals	20,605	21,409	22,094	64,108	151,765	-87,657	-57.8
451	Walking facilities	0	0	0	0	720,002	-720,002	-100.0
452	Cycling facilities	0	0	0	0	2,684,998	-2,684,998	-100.0
Walking and Cycling Improvements		46,400	48,210	49,752	144,362	3,763,341	-3,618,980	-96.2
Improvements Total		298,640	382,746	282,301	963,687	9,866,880	-8,903,194	-90.2

2.7.3 Total subsidised programme

	2024-25	2025-26	2026-27	Total 2024-27	Total 2021-24	Change	%
Investment Management	11,771	44,990	80,238	136,999	309,906	-172,907	-55.8
Local Road Operations	5,079,615	5,029,839	5,282,300	15,391,754	12,186,371	3,205,383	26.3
Local Road Pothole Prevention	7,451,802	7,760,987	7,962,141	23,174,930	18,637,741	4,537,189	24.3
Local Road Improvements	0	0	0	0	7,586,225	-7,586,225	-100.0
Walking & Cycling Improvements	46,400	47,204	47,889	141,492	3,763,341	-3,621,849	-96.2
Public Transport (O&M)	0	0	0	0	15,495	-15,495	-100.0
Subsidised Total (Exc. CRF)	12,589,588	12,883,019	13,372,568	38,845,176	42,499,080	-3,653,904	-8.6
Crown Resilience Fund	252,240	334,536	232,548	819,325	0	819,325	-
Combined Total (Inc. CRF)	12,841,828	13,217,556	13,605,116	39,664,500	42,499,080	-2,834,579	-6.7

3.0 Non-subsidised programme

The following activities are not eligible for funding assistance from NZTA

3.1 Maintenance and operations

3.1.1 Services maintenance

Non-subsidised activities include:

- *Aesthetic treatments on berms, shoulders and traffic islands*
- *Sand and debris clearance to beach access roads*
- *Maintenance of the area between the kerb and the road reserve in urban areas*
- *Control of noxious plants declared in terms of the Biosecurity Act 1993 within the road reserve*
- *The maintenance of off-street parking areas*

3.1.2 Amenity operations

Non-subsidised activities include costs related to amenity lighting, which includes the lighting of:

- *Buildings*
- *Property and reserves*
- *Under-veranda lighting*
- *Festive lighting*
- *Any other lighting not directly related to the operation of a road*

3.1.3 Network and asset management

These are activities carried out by in-house professional services that are related to the asset management of all non-subsidised maintenance and operations

Council's Roading Response Reserve

The Roading Response Reserve fund is currently in deficit due to recent and numerous adverse weather events – a proportion of funding is to be allocated to reinstate financial resilience

3.1.4 Summary | Non-subsidised maintenance and operations

	2024-25	2025-26	2026-27
Sealed pavement maintenance	58,262	60,534	62,472
Community event management	47,295	49,140	50,712
Feilding CBD maintenance	61,623	64,027	66,075
Sand clearance (Tangimoana Beach Rd, Himatangi Beach Access)	16,807	17,462	18,021
Network and asset management	25,765	26,770	27,627
Roading response reserve	157,650	163,798	169,040
Non-subsidised Maintenance & Operations Totals	367,402	381,731	393,946

3.2 Renewals

3.2.1 Asset renewals

Non-subsidised activities include costs related to:

- *Renewal of roadside berm features*
- *Kerb and Channel renewals to non-road related council assets*
- *Vehicle crossing renewals*
- *Renewal of off-street parking facilities*
- *Second coat sealing of Subdivisional (new) roads*

3.2.2 Summary | Non-subsidised renewals

	2024-25	2025-26	2026-27
Roading renewals	107,560	111,755	115,331
Non-subsidised Roading Renewals Totals	107,560	111,755	115,331

3.3 Improvements

3.3.1 Overview of current network growth and conditions

Urban growth requirements around Feilding have been progressing. A total of 4 residential growth precincts and one industrial growth precinct have been identified in the Feilding Urban Growth Framework Study (2013).
Precinct's 1, 2, and 3 were re-zoned from Rural to Deferred Residential Zone in 2014. The Deferred Residential Zoning is intended to be uplifted once a review of the District Plan's hazards chapter has been undertaken. These areas are located to the west of Feilding, with a combined total yield of 1,860 new residential lots at minimum lot sizes between 800m^2 and 2,000m^2.

Precinct 4 has been rezoned to Residential Zone in 2020. It is noted that Precinct 4 is envisioned to provide the majority of Feilding's residential growth over the next 10 years, resulting in approximately 1,600 lots.
Precinct 5 was re-zoned from Rural to Industrial Zone in 2015. In total, Precinct 5 has the potential to release an additional 97ha for future industrial land use

3.3.2 Urban reconstructions

Means an entire 'rebuild', generally from boundary to boundary of an urban road corridor, constituting (but not limited to) NEW 3-waters and utility infrastructure installation, with NEW pavement, seal, kerb and channel, sumps, berms, footpaths, aesthetic planting (i.e., street trees), vehicle crossings, road marking, and signage. This activity is not eligible for NZTA funding assistance

There are no urban reconstruction projects proposed before 2030-31

3.3.3 Mitigation sealing

Means the sealing of isolated sections within the unsealed road network to:

- *mitigate dust nuisance*
- *reduce maintenance costs (where economically feasible), or*
- *upon Council instruction*

These activities are not eligible for funding assistance from NZTA, with the exception of:

- *Sealing of bridge approaches on unsealed roads, where the approach sealing is limited to a max distance of 50 metres from the abutment, and continues over the entire structure to ensure consistency of skid resistance*

There are no mitigation seals programmed for this funding period

3.3.4 Subdivisional roads (new and upgraded)

Means the construction of Subdivisional roads that are not eligible for NZTA funding assistance, which includes second coat sealing.

NEW Subdivisional roads - constructed by Council - attract a Development Contribution of 100% towards estimated costs, whereas the UPGRADING of existing road corridors (as a result of identified growth) may attract a lesser 50% Development Contribution towards estimated costs

			2024-25	2025-26	2026-27
	Length	Dev. Contribution			
Precinct 4 - Root Street East (Stage 1)	0.400	100%	1,168,000		
Precinct 4 - Root Street East (Stage 2)	0.400	100%		965,254	
Reid Line West	0.400	100%			935,144
Strategic Land Acquisition	-	100%	28,887	30,797	32,642
Non-subsidised Sub-divisional Road Totals			1,196,887	996,051	967,786

Note: Construction or upgrade of road corridor assets (i.e., pavements, kerbs, etc) is dependent on 3 waters related infrastructure planning and installation timeframes in order to meet the indicated programme

3.3.5 Industrial and commercial roads

The Manawatū District is experiencing a period of economic growth, alongside moderate population growth and emerging opportunities through Central Government investment in improving accessibility between the markets of Wellington and the lower and Central North Island. Providing suitable infrastructure to maximise opportunities for economic development is a fundamental role of local government

Turners Road

Turners Road is being extended through to Kawakawa Road and is currently under construction, prior to inception of this programme Business Case). The extension of Turner Road will enable the development of 24ha of high-quality industrial land, creating a competitive advantage over alternative locations for industrial development across the wider Manawatū Region and drawing significant private investment into the district. The creation of jobs and additional local spending, both commercially and from the increased prosperity of residents, will provide significant benefits to local businesses and support the ongoing resilience and prosperity of Manawatū District communities

There are no further commercial or industrial roads programmed for this funding period

3.3.6 Non-subsidised improvements (other)

The construction of footpaths or cycle paths unconnected to the wider network and/or recreational in nature are not generally eligible for NZTA funding assistance, including structures associated with such projects
Likewise, intersection or corridor improvements that do not meet NZTA criteria for economic benefit (i.e., safety or efficiency) must be funded entirely by Council (i.e., without NZTA funding assistance), if chosen to proceed

	Route Position (km)			2024-25	2025-26	2026-27
Road Name	Start	End	Length			
Watershed Road - Hiwinui Footpath Extension	2.360	3.002	0.642			306,423
Banks Road - Rongotea Footpath Extension	0.000	0.590	0.590		188,643	
Non-subsidised Improvements (Other) Totals				0	188,643	306,423

3.3.7 Summary | Non-subsidised road improvements

	2024-25	2025-26	2026-27
Urban reconstructions	0	0	0
Mitigation sealing	0	0	0
Sub-divisional roads (Growth & Upgrades)	1,196,887	996,051	967,786
Industrial & commercial roads	0	0	0
Improvements (Other)	0	188,643	306,423
Non-subsidised Road Improvements Totals	1,196,887	1,184,694	1,274,209

3.4 Non-subsidised investment summary

	2024-25	2025-26	2026-27	Total 2024-27	Total 2021-24	Change	%
Maintenance & Operations	367,402	381,731	393,946	1,143,080	656,988	486,091	74.0
Renewals	107,560	111,755	115,331	334,647	297,509	37,138	12.5
New Roads	1,196,887	996,051	967,786	3,160,725	3,045,734	114,991	3.8
Improvements (Other)	0	188,643	306,423	495,066	520,390	-25,324	-4.9
Total Non-Subsidised Investment	1,671,850	1,678,181	1,783,487	5,133,518	4,520,622	612,896	13.6

4.0 Programme Investment

4.1 2024-27 programme

Where activities within Council's proposed Roading Programme are eligible for financial assistance, NZTA currently provides a subsidy of 51% towards this expenditure, known as the Financial Assistance Rate (FAR). This assistance rate is expected to stay the same throughout the 2024-27 NLTF period. The table below details the total value of proposed work, split by eligibility for subsidised funding, summarising the total investment demand for each party over the 2024-27 period, and the overall change from the previous investment cycle, including the recently announced Crown Resilience Fund at an enhanced assistance rate:

	2024-25	2025-26	2026-27	Total 2024-27	Total 2021-24	Change	%
Subsidised	12,589,588	12,883,019	13,372,568	38,845,176	42,499,080	-3,653,904	-8.6
Non-subsidised	1,671,850	1,678,181	1,783,487	5,133,518	4,520,622	612,896	13.6
Crown Resilience Fund (CRF)	252,240	334,536	232,548	819,325	0	819,325	-
Proportional Investment (exc. CRF)	**2024-25**	**2025-26**	**2026-27**	**Total 2024-27**	**Total 2021-24**	**Change**	**%**
Financial Assistance Rate (FAR)	51%	51%	51%				
New Zealand Transport Agency	6,403,281	6,552,252	6,801,343	19,756,875	22,101,950	-2,345,075	-10.6
Approved Organisation	6,661,270	7,012,897	7,386,926	21,061,093	21,889,045	-827,952	-3.8
Other Sources (Development Contribution)	1,196,887	996,051	967,786	3,160,725	3,028,706	132,019	4.4
Programme Investment (exc. CRF)	14,261,438	14,561,200	15,156,055	43,978,693	47,019,701	-3,041,008	-6.5
CRF Proportional Investment	**2024-25**	**2025-26**	**2026-27**	**Total 2024-27**	**Total 2021-24**	**Change**	**%**
Enhanced Financial Assistance Rate	76%	76%	76%				
Crown Resilience Fund	191,702	254,248	176,737	622,687	0	622,687	-
Approved Organisation	60,538	80,289	55,812	196,638	0	196,638	-
Proportional Investment (inc. CRF)	**2024-25**	**2025-26**	**2026-27**	**Total 2024-27**	**Total 2021-24**	**Change**	**%**
New Zealand Transport Agency	6,403,281	6,552,252	6,801,343	19,756,875	22,101,950	-2,345,075	-10.6
Approved Organisation	6,721,808	7,093,186	7,442,738	21,257,731	21,889,045	-631,314	-2.9
Other Sources (Crown Resilience Fund)	191,702	254,248	176,737	622,687	0	622,687	-
Other Sources (DC's)	1,196,887	996,051	967,786	3,160,725	3,028,706	132,019	4.4
Programme Investment (inc. CRF)	14,513,678	14,895,737	15,388,603	44,798,018	47,019,701	-2,221,684	-4.7

4.2 10-year investment forecast

10 Year Forecast										
Activity Class	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34
Subsidised Activities										
Expenditure (by GPS Activity Class)										
State highway pothole prevention										
State highway operations										
Local road pothole prevention	7,451,802	7,760,987	7,962,141	11,330,512	12,288,694	11,774,890	12,476,410	13,297,093	13,258,372	14,796,580
Local road operations	5,079,615	5,029,839	5,282,300	5,469,941	5,498,569	5,825,249	5,687,455	5,761,392	5,819,006	5,969,025
Public transport services										
Investment management	11,771	44,990	80,238	12,975	48,827	85,985	13,742	51,208	89,381	14,172
Safety										
Rail network										
Public transport infrastructure	0	0	0	6,372	6,518	6,642	6,748	6,836	6,904	6,960
State highway improvements										
Local road improvements	252,240	334,536	232,548	2,612,787	2,862,941	3,894,028	3,778,879	3,836,835	3,937,971	2,260,560
Walking and cycling improvements	46,400	48,210	49,752	1,026,735	1,018,255	1,074,415	913,844	873,780	1,016,014	765,679
Total Expenditure	12,841,828	13,218,562	13,606,980	20,459,323	21,723,804	22,661,208	22,877,079	23,827,146	24,127,649	23,812,976
Revenue for subsidised activities										
Approved Organisation Revenue	6,246,845	6,411,056	6,627,037	10,025,068	10,644,664	11,103,992	11,209,769	11,675,301	11,822,548	11,668,358
NLTF Revenue	6,403,281	6,552,252	6,801,343	10,434,255	11,079,140	11,557,216	11,667,310	12,151,844	12,305,101	12,144,618
Other Revenue (Crown Resilience Fund)	191,702	254,248	176,737							
Total Revenue	12,841,828	13,217,556	13,605,116	20,459,323	21,723,804	22,661,208	22,877,079	23,827,146	24,127,649	23,812,976
Unsubsidised Activities										
Expenditure										
Unsubsidised Operational Expenditure	474,963	493,486	509,278	523,538	535,579	545,755	554,487	561,695	567,312	571,851
Unsubsidised Capital Expenditure	1,196,887	1,184,694	1,274,209	3,222,422	3,250,645	2,586,230	2,470,170	3,123,513	4,105,781	2,346,713
Total Unsubsidised expenditure	1,671,850	1,678,181	1,783,487	3,745,960	3,786,224	3,131,985	3,024,657	3,685,209	4,673,093	2,918,564
Revenue for Unsubsidised Activities										
Local Authority Revenue	474,963	682,129	815,701	1,919,623	1,867,318	1,919,169	2,122,708	1,933,524	2,058,463	969,735
Other Revenue (Development Contributions)	1,196,887	996,051	967,786	1,826,337	1,918,906	1,212,816	901,949	1,751,684	2,614,630	1,948,829
Total revenue	1,671,850	1,678,181	1,783,487	3,745,960	3,786,224	3,131,985	3,024,657	3,685,209	4,673,093	2,918,564

Forecast figures include adjustment by predicted inflation rates over the next ten years, based on figures published by the 'Business and Economic Research Ltd' (BERL) organisation.

5.0 Procurement management

5.1 Integration and partnering

Council's proposed programme and related activities is aligned and integrated with the procurement programmes of other approved organisations and other entities. The 3-year programmes are routinely co-ordinated on a regional level with other roading authorities in Rangitīkei, Horowhenua and Palmerston North. The level of impact these authorities have on Council's transport procurement is minimal, but opportunities for packaging or integrating to provide better value for money is constantly discussed.

MDC shares a number of boundary roads with Palmerston North City Council, Rangitīkei, Tararua, and Horowhenua District Councils; a very co-operative relationship exists to deliver appropriate levels of service on these roads.

A more significant impact on procurement activities (and budget) is between Council and the numerous utility organisations, where co-ordination of the various programmes and acknowledgement of the commercial imperatives of the utilities can reduce customer and network interruption and disruption. Council has therefore adopted protocols with the service providers to ensure better budget provisions to achieve best value for money. The Manawatū and Rangitīkei District Council's shared water services department (water supply and wastewater) is a key utility where close co-operation and forward work programme alignment is a strong focus.

Private property development is managed through resource consent and land use regulation processes and impacts on the transport corridor are managed appropriately. Where there are significant impacts on the network, special conditions or agreements are arranged between the parties.

As with most RCA's, the local road network also interacts with State Highway roads (owned and operated by NZTA). Continuous liaison is undertaken with NZTA to aid co-ordination of transport related activities.

Council has considered its Roading Programme thinking about ongoing and rescheduled [26] project and has adjusted planned interventions to minimise conflicts with resource (e.g., selecting pavement stabilisations where possible, as opposed to overlays, to reduce material demand when carrying out rehabilitations). External activities will need to be monitored and local operations adjusted accordingly.

5.2 Procurement capability

Council maintains ownership and responsibility for managing the land transport activity and the associated infrastructure. In order to maximise efficiencies and long-term value for money, the Council has taken a holistic approach to service delivery. MDCs approach to the market and contracting align with procurement best practices and demonstrates that Council is open, transparent, and accountable. The Procurement Strategy for MDC is reviewed every 3 years and lays out the requirements for procurement (at any value) to be made by Council.

The Manawatū District Council Procurement Policy is based on - and complements - the 'Government Procurement Rules': (https://www.procurement.govt.nz/procurement/principles-charter-and-rules/government-procurement-rules/

[26] *Projects from the current FWP have been rescheduled due the reprioritisation of allocated funding to repair portions of the network that had been damaged during recent weather events*

whilst paying particular attention to NZTA's 'Procurement manual for activities funded through the National Land Transport Programme' (https://www.nzta.govt.nz/resources/procurement-manual/).

Council has an 'open' supplier selection process as its default position. Direct appointments and 'closed contest' processes may be considered for low value contracts. Council's transportation procurement procedures will be based on a selection of the procedures as documented in the latest edition of NZTA's Procurement Manual.

In addition to the internal review and compliance with procurement rules, Council utilises the REG developed tool; designed to assist Road Controlling Authorities (RCA's) when making procurement and service delivery decisions.

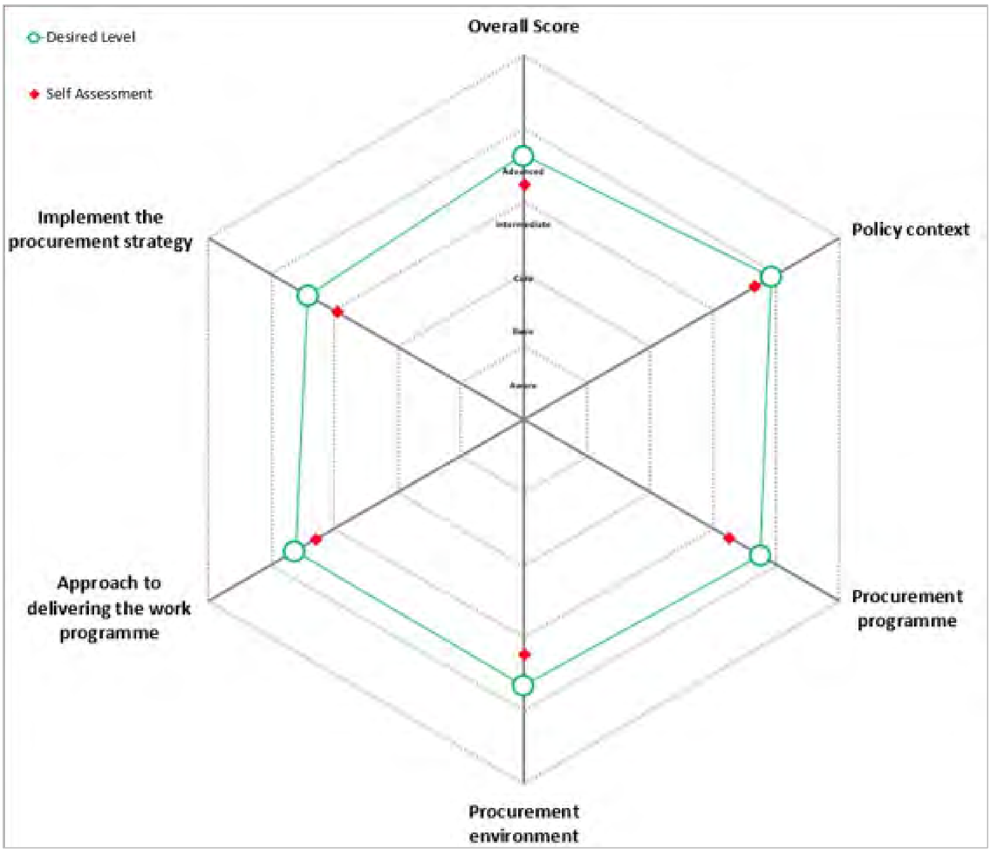


FIGURE 65: REG SMART BUYER PRINCIPLES | SPIDER DIAGRAM

The aim is to improve road maintenance delivery decisions, affirming value for money and understanding an RCA's ability to procure the services they require in the best possible way.

A "Smart Buyer Self-Assessment Tool" was created for RCA's to self-assess their targeted vs actual procurement performance. A summary of Councils recent self-assessment is shown in Figure 65 above.

MDC has also conducted the Transport Insights Groups 'Smart Buyer Principles' assessment tool, shown in Table 34 below. This indicates that MDC is a 'developing' buyer with good core values and expertise:

TABLE 34: REG SMART BUYER PRINCIPLES ASSESSMENT CHECKLIST

Assessment statement	Score				
	1	2	3	4	5
1. Fully understands the different contracting models available					✓
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. Has sufficient robust data (or is in the process of gathering robust data) on our networks that enables optimal integrated decision-making				✓	
4. Has access to expertise that fully enables best use of the data available				✓	
5. Is open to alternative solutions to those proposed in the contract documents				✓	
6. Understands risk and how to allocate and manage it				✓	
7. Has a Council that is prepared to pay more now to achieve a lower whole of life cost					✓
8. Actively pursues value for money & does not always award contracts to the lowest price					✓
9. Is able to manage supplier relationships / contracts to ensure that expenditure is optimal and sustains infrastructural assets at appropriate levels of service				✓	
10. Supports ongoing skill and competency training and development for its staff				✓	
11. Actively participates in gatherings to share and gain knowledge within the sector				✓	
12. Is effective in keeping up with best practice in procurement including best practice RFP / contract documentation					✓
13. Regularly seeks and receives candid feedback from suppliers on its own performance as a client and consistently looks to improve its performance				✓	
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.				✓	
Number of ticks in each column				10	4
Multiplying factor	x1	x2	x3	x4	x5
Total Score in Column				40	20
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.

PART C | ASSET MANAGEMENT

1.1 Introduction

ISO 55000 defines asset management as the "coordinated activity of an organisation to realize value from assets". An asset is an item, thing or entity that has potential or actual value to an organisation. Activity management involves the balancing of costs, opportunities and risks against the desired performance of assets, to achieve the organisational objectives. This balancing might need to be considered over different timeframes.

Asset management enables Council to examine the need for, and performance of, assets and asset systems at different levels. Additionally, it enables the application of analytical approaches towards managing an asset over the different stages of its lifecycle (which can start with the conception of the need for the asset, through to its disposal, and includes the managing of any potential post disposal liabilities).

Asset management is the art and science of making the right decisions and optimising the delivery of value. A common objective is to minimise the whole life cost of assets but there may be other critical factors such as risk or business continuity to be considered objectively in this decision making.

1.2 Goals and objectives of asset ownership

1.2.1 Corporate Goals

Council ensures that all items of programme development and implementation align with the strategic direction by setting maintenance intervention criteria for the different road assets, depending on their classification:

- Using the ONRC customer level of service (CLoS) performance measures
- Aligning the programme with the strategic direction and CLoS outcomes
- Optimising the intervention options when developing the total needs programme
- Prioritising candidate projects when developing the works programme
- Selecting the types of treatments, materials and construction techniques when implementing the programme
- Ensuring that the activity management plan (AMP) follows the strategic direction.

1.2.2 Business frameworks

Council's road and bridge assets are managed by the Roading Manager who works with the Roading Operations Manager and other roading staff to discharge all his responsibilities for operational, daily, short-term, medium term and strategic planning of the road network and its maintenance. Road network professional services are largely delivered by in-house staff, who are accountable to the Asset Manager.

There are a number of cross-departmental links that are important to the correct functioning of the roading team and management of the roading network. The most significant of these are with the financial and administration services staff.

Council's committee structure is extensive and are established under the LGA 2002. Each township, excluding Feilding, and rural community also has a local Community Committee elected every three years at a specially convened public meeting. The purpose of the committee is to consult with its community and relay local concerns and preferences to the Council. Township services and beautification projects are generally undertaken in conjunction with, or at the behest of, local township committees.

The full list of the Boards and Committees is:

- Āpiti Community Committee
- Bainesse/Rangiotū Community Committee
- Beaconsfield Community Committee
- Cheltenham Community Committee
- Colyton Community Committee
- Halcombe Community Committee
- Hīmatangi Beach Community Committee
- Hiwinui Community Committee
- Kimbolton Community Committee
- Kiwitea Community Committee
- Pōhangina Valley Community Committee
- Rangiwāhia Community Committee
- Rongotea Community Committee
- Sanson Community Committee
- Tangimoana Community Committee
- Waituna West and District Community Committee

1.2.3 Organisational culture

An important measure of the quality of Council's activity management is the ability, experience and qualifications of the individuals and companies involved in its preparation. Council employs a limited range of technical staff qualified to carry out the activity management function.

In this context competency refers to applied knowledge, it is not just the knowledge itself. Competencies can be described as: The behaviours that employees must have, or must acquire, to input into a situation in order to achieve high levels of performance.

There are a large number of competencies that the Council requires of its staff to effectively manage its transportation network assets; these are not statements of current individual's skills or competencies; rather, they are statements of the Council's desired competency in the areas and subjects detailed. Council's People and Culture Group establish the gaps between the competencies of current staff and the competencies required in the organisation. These gaps will be used to guide staff training and development programmes. These inform the recruitment process for staff involved in road activity management when new positions are being filled or replacement staff sought.

To ensure that staff were thinking and working towards a common LTP goal, Council management instigated a LTP planning process early in 2022 for the 2024-34 LTP. The group consisted of senior managers, planners, asset managers, and accountants.

This group meets regularly and provides direction on issues such as:

- Council priorities
- Agreed assumptions
- Growth projection
- Plan format and style
- Communication and consultation
- Auditing processes

1.2.4 Financial sustainability

The LGA 2002 requires Council to prepare a Financial Strategy as part of its Long Term Plan. This Strategy outlines how the Council intends to manage it finances prudently. This means the Council will act with careful deliberation and will always consider the financial implications of decisions on the community.

Council must make adequate and effective provision to meet expenditure needs identified in Annual and Long Term Plans.

The Financial Strategy provides a financial framework for making decisions. Simply, it enables Council to assess proposed spending against rates and borrowing requirements over the whole ten years of the Long Term Plan 10 year plan. It draws together all of the issues in the LTP along with the financial consequences and presents these along with the Council's response. This will:

- Enable the community to readily identify what the financial issues are
- Provide the community with certainty about how expenditure will be met
- The impacts of proposals on levels of services, rates, debts and investment
- Enable the community to predict how the Council intends to manage the financial issues in the future
- Provide guidance to decision makers when considering implications of financial issues on communities now and in the future

Council's vision is for a "connected, vibrant, thriving Manawatū - best rural lifestyle in New Zealand". The services and projects outlined in the Long Term Plan will ensure this vision becomes a reality. The provision of services and projects comes at a cost. Council aims to spend within its means, achieving a balance between meeting the needs of the community with its ability to pay.

1.2.5 Asset management

Roading activity management covers a 30 year planning period, in accordance with the International Infrastructure Management Manual. It is prepared to meet legislative and user requirements for sustainable service delivery and long term financial planning and reporting. This activity management plan uses a 'bottom up' approach for gathering detailed asset information for individual assets to support the provision of activities and programmes to meet agreed Customer Levels of Service in a financially sustainable manner.

1.3 Strategic and corporate goals

1.3.1 Significance policy

Under the LGA 2002, each Council is required to have a Policy of Significance. The requirements for the policy can be seen as being a means for ensuring that in making decisions that Council is:

- Clear about why it is addressing a matter
- Has considered and evaluated the options and alternatives
- Has information on the community view about the matter and the options for addressing it, and particularly it has an understanding of the views and preferences of those persons likely to be affected by - or have an interest in - the matter

A Significant Activity is one that has a high degree of significance in terms of its impact on either:

- The well-being of the people and environment of Manawatū District and/or
- Persons likely to be affected by or with an interest in that activity and/or
- Capacity of MDC to provide for the well-being of the district
- Transportation is considered by the MDC as significant activities therefore requires consultation

The Council's Public Consultation Policy (C301) states that the Council will:

- Clarify its expectations through public consultation
- Allow sufficient time for effective response to its proposals
- Report on public proposals and follow up when necessary
- Maintain the consultative process

There are a number of instances where the Council will undertake consultation at a District wide or comprehensive level. This generally occurs when there is a requirement to use the Special Consultative Procedure as prescribed in the LGA 2002. This occurs in the following situations:

- Adopting the annual budget
- Adopting, amending or reviewing a bylaw
- Proposing a change in the way a significant activity is undertaken
- Significant decisions not already provided for in the community plan
- Termination of a service
- Adopting or amending the community plan. The community plan is reviewed every three years with the annual plan giving effect to that plan in the intervening years. The Council must consult on community outcomes at least every six years

The Council will decide that some decisions are significant and will therefore require a more rigorous assessment of options and a more robust consultative process. Those decisions are treated as amendments to the Community Plan and can be dealt with either separately or as part of the Annual Plan process.

To date the transportation levels of service have been in a process of development and refinement. The One Network Road Classification (ONRC) set of levels of service are now established within the district context.

The goal of the ONRC system is to provide road users, whether they are vehicle drivers, riders on passenger transport, cyclists or pedestrians with more consistent customer levels of service across the country. This is important for road users of the network as diverse as freight operators who want to know the costs of operating their vehicles across multiple District networks and how to value journey time consistency and reliability.

1.4 Legislative requirements

1.4.1 The New Zealand Transport Strategy (NZTS) and Long Term Strategic View (LTSV)

This provides the Government's over-arching strategic vision for transport "People and freight in New Zealand have access to an affordable, integrated, safe responsive and sustainable transport system".

It is supported by 5 principal transport objectives:

- Ensuring environmental sustainability
- Assisting economic development
- Assisting safety and personal security
- Improving access and mobility
- Protecting and promoting public health

To deliver the vision and targets of the Strategy, key components have been identified for government intervention and facilitation by regulation, enforcement, economic incentives, investment, and education as follows:

- Integrated land use and transport planning
- Making best use of existing networks and infrastructure
- Investing in critical infrastructure and the transport sector
- Increasing the availability and use of public transport, cycling, walking and other shared and active modes

Legislation is established by Central Government and must be complied with at Local Government Level. Significant legislation and regulations affecting the Transportation activities are provided below.

1.4.2 Civil Defence Emergency Management Act 2002

Requires Council's services to function at the fullest possible extent during and after an emergency, even though this may be at a reduced level. In addition, Council has established planning and operational relationships with regional CDEM groups to deliver emergency management within our boundaries. Transportation is regarded as a critical service and is given special consideration within Council emergency management procedures. Every effort will be given to restore services immediately after an event to at least provide limited access.

1.4.3 Health and Safety at Work Act 2015

New Zealand's key work health and safety legislation is the Health and Safety at Work Act 2015 (HSWA) and regulations made under that Act. All work and workplaces are covered by HSWA unless specifically excluded.

1.4.4 Land Transport Management Act (LTMA) 2003

This document contains particular requirements for content, development of and consultation on the District's Land Transport Programme prior to its adoption by the Council. The original Act was amended in 2008 by the Land Transport Management

Amendment Act, which introduced the requirement for a Regional Transport Committee (RTC) to develop a three year Regional Land Transport Programme (RLTP). The Horizons Regional Council is responsible for preparing the Manawatū-Wanganui programme. The programme is required to detail at least the first three financial years' activities, relating to road maintenance, renewals, improvements and public transport services, identified by Approved Organisations/Road Controlling Authorities (RCA's) in the region. The regional programme is then submitted to the New Zealand Transport Agency Waka Kotahi (NZTA) for incorporation into the National Land Transport Programme (NLTP); 10-year forecasts are also required.

1.4.5 Local Government Act (LGA) 2002

Part 6 | Planning, Decision-Making, and Accountability. The consultation and community outcomes sections of this part are particularly relevant. The community outcomes requirements for this Activity management plan are met through the Council's Long Term Plan process

Part 7 | Specific Obligations and Restrictions on Local Authorities and Other Persons

Schedule 10 | Council plans and reports on the requirement to consider all options and to assess the benefits and costs of each option.

1.4.6 Utilities Access Act 2010

Provides for a coordinated approach to management of the road corridor. The Act requires the Corridor Managers to undertake a planning and access management role, and Utility operators to comply with an approved code of practice.

1.4.7 National planning documents and standards

- Government's Sustainable Development Action Plan
- New Zealand Standard SNZHB 4360:2000 'Risk Management for Local Government'
- The National Land Transport Strategy
- National Energy Efficiency and Conservation Strategy
- The NZTA Maintenance Guidelines for Local Roads
- The New Zealand Coastal Policy Statement 1994
- The (proposed) National Environmental Standard relating to land transport noise from major roads
- NZS 4404:2004 Land Development and Subdivision Engineering
- SNZ HB 2002:2003 Code of Practice for Working in the Road (NZUAG Roadshare)
- National Land Transport Programme
- National Infrastructure Plan 2011
- The Building Regulations 1992
- The Heavy Motor Vehicle Regulations 1974
- Land Transport Rule: Setting of Speed Limits 2022
- Land Transport Rule: Traffic Control Devices 2004

1.4.8 Horizons Regional Council strategies, policies and plans

Section 75 of the LTMA 2003 requires an RTC to produce a Regional Land Transport Strategy (RLTS). The 2024 - 2054 RLTS is closely aligned with the objectives of the NZTS and LTMA, tailored for the Manawatū region. It includes strategies to accommodate projected growth in the region and the resulting traffic growth or demands for further transport services.

1.4.9 Council strategies

- Sustainability Principal
- District Wide Strategy
- Council Infrastructure Strategy
- Manawatū Walking & Cycling Strategy 2020
- Roading Procurement Strategy

1.4.10 Council documents

- Manawatū District Long Term Plan
- Manawatū District Plan
- Feilding Urban Growth Framework
- Council Policies
- Council Bylaws

1.4.11 Environmental legislative obligations

There are a number of legislative mechanisms aimed to avoid or mitigate potential adverse environmental effects associated with the management of the Transport network. These are set at national, regional and district level.

The role of Central Government is one of setting policy for activity management across New Zealand. This is achieved through the following:

- Resource Management Act 1991
- Local Government Act 2002
- Land Transport Management Act 2003
- Land Transport (Road Safety and Other Matters) Amendment Act 2011
- Government Policy Statement on Land Transport (GPS) Funding
- Hazardous Substances and New Organisms Act 1996

1.4.12 Resource Management Act plans

The Horizons Regional Council is responsible under the RMA for ensuring that the natural and physical resources of the region (such as the land, air, water and coastal resources) are managed in a sustainable manner.

1.4.13 Horizons regional plan

The Horizons One Plan applies to the management of air, land and water resources in the region including: air, soil, rivers and streams, lakes, groundwater, wetlands and the coast. The One Plan identifies natural values of the regions resources and policies for protecting them. It identifies specific management areas related certain streams, lakes, wetlands, aquifers and air quality areas. It also identifies rules that specify whether an activity is permitted or whether resource consent is needed.

1.4.14 District plan

This provides zoning throughout the district. Certain activities that are permitted in one zone may not be permitted in another. The different types of resource consents are Land use and subdivision. Activities that need resource consent are classified as controlled restricted discretionary, discretionary and non-complying.

1.4.15 Long term plan

Council has specified “Environmentally responsible development” in relation to land transport as a community outcome in the Long Term Plan.

1.4.16 Horizons Regional Land Transport Strategy (RLTS)

Sets the strategic direction for transport in the Region by describing the vision, objectives and outcomes that will guide the development of the Region’s transport network over the next 30 years. The Strategy covers all forms of land transport, including public transport, local roads, state highways, walking and cycling.

Section 175(2)(h) of the Land Transport Act as amended by the LTMA 2011, states that every RLTS must give early and full consideration to land transport options and alternatives in a way that avoids, to the extent reasonable in the circumstances, adverse effects on the environment. It is important to note that the RLTS is a strategic document and does not cover detail at a micro level (i.e., project design). The Strategy, however, provides the strategic direction for future projects.

1.4.17 Resource consents

If the construction of an asset does not meet the development controls outlined in the District Plan or relates to an activity that has the potential to result in adverse effects on the environment, beyond those contemplated by the District Plan provisions, resource consent may be required. An Assessment of Environmental Effects (AEE) is required to support any resource consent applications to the respective Councils when seeking approval to construct, alter or vary the use of a facility or building that is not permitted by the relevant plan.

The AEE process involves the identification and assessment of both the potential and the perceived physical, social and cultural impacts that the proposed works may have on the existing environment, includes the examination and comparison of options and alternatives for mitigating any identified adverse effects, and the confirmation and recommendations on the preferred options and methodology to carry out the works.

The critical environmental factors requiring consideration may include geological and geotechnical effects of land movement (cut and fill), the ecological and biological effects of vegetation removal or earthworks, and the cultural, archaeological and social effects on the environment of the development. These, together with noise, traffic, and visual effects, may require specialist inputs and consultation with the local communities.

2.0 Levels of service

2.1 Customer levels of service

2.1.1 Overarching principles

- Over time all roads in a particular category should offer an increasingly consistent, fit for purpose customer level of service for road users
- Value for money and whole of life cost will be optimised in the delivery of affordable customer levels of service
- The customer levels of service will be delivered in the context of an integrated national network, integrating land-use and transport, including all modes and both rural and urban areas
- The customer levels of service will be delivered in the context of a safe system approach, which aims to create a forgiving road system, where human error and vulnerability do not result in death or serious injury

2.1.2 Foundations

- Customer levels of service are delivered in line with Council's empathy, assurance, response and tangibles principles
- Capacity limits on the network may require actions that shape demand to provide for the cost effective and efficient travel choice needs for customers
- The delivery of customer levels of service for all modes will be optimised by time of day consistent with the principles of network operating planning and activity management planning
- Local factors (e.g., topography, geology, climate, adjacent land-use and 'place' function, population density) may influence delivery of the customer levels of service
- The functional classification and its customer levels of service will be reviewed regularly
- The customer levels of service delivered for any route in the network will consider whether it functions as a critical lifeline for nationally significant infrastructure and its resilience will be delivered by considering a multi-modal, whole-of-network approach
- Access to the transport network by network utility operators and community events will be managed to limit the impact on transport network users

Non-financial performance measures rules 2013

Pursuant to and in accordance with section 261B of the LGA 2002, the Secretary for Local Government makes the following rules.

These rules are the Non-Financial Performance Measures Rules 2013 (As they apply to the Roading Asset).

Commencement

These Rules come into force on 30 July 2014.

Interpretation

In these rules, unless the context otherwise requires, -

Abatement notice means a notice served under section 322 of the Resource Management Act 1991.

Conviction means the conviction of an offence under section 343C of the Resource Management Act 1991.

Enforcement order means an order made under section 319 of the Resource Management Act 1991 for any of the purposes set out in section 314 of that Act; and includes an interim enforcement order made under section 320 of that Act.

Financial year means a period of 12 months ending on 30 June.

Flooding event means an overflow of stormwater from a territorial authority's stormwater system that enters a habitable floor.

Flood protection and control works means physical structures owned by local authorities and designed to protect urban and rural areas from flooding from rivers, including ancillary works such as channel realignment or gravel removal.

Footpath means so much of any road as is laid out or constructed by a territorial authority primarily for pedestrians or cyclists; including its edging, kerbing, and channelling, and includes dedicated cycleways.

Infringement notice means a notice issued under section 343C of the Resource Management Act 1991 local authority means a regional council or a territorial authority.

Local authority means a regional council or a territorial authority.

Major flood protection and control works means flood protection and control works that meet two or more of the following criteria:

a. Operating expenditure of more than $250,000 in any one year
b. Capital expenditure of more than $1 million in any one year
c. Scheme asset replacement value of more than $10 million, or
d. directly benefitting a population of at least 5,000 people

Regional Council has the same meaning as in section 5(1) of the Local Government Act 2002.

Road has the same meaning as in section 315 of the Local Government Act 1974.

Sealed local road network means all roads having a sealed or paved surface within a territorial authority's district subject to the exclusions set out in section 317 of the Local Government Act 1974.

Smooth travel exposure means a measure of the percentage of vehicle kilometres travelled on roads that occurs above the targeted conditions for those roads, calculated in accordance with standard industry methodology.

Stormwater system means the pipes and infrastructure (excluding roads) that collect and manage rainwater run-off from the point of connection to the point of discharge.

Territorial Authority means a city council or a district council named in Part 2 of Schedule 2 to the Local Government Act 2002.

Territorial Authority District means a district in respect of which a territorial authority is constituted; and, in relation to land in respect of which the Minister of Local Government is the territorial authority, means that land Measurement Period Any calculation, measure, number or percentage set out in Part 2 of these Rules must be calculated for a financial year (unless otherwise specified in these Rules).

Sub-part 5 | the provision of roads and footpaths

Performance measure 1 (road safety)

The change from the previous financial year in the number of fatalities and serious injury crashes on the local road network, expressed as a number.

Performance measure 2 (road condition)

The average quality of ride on a sealed local road network, measured by smooth travel exposure.

Performance measure 3 (road maintenance)

The percentage of the sealed local road network that is resurfaced.

Performance measure 4 (footpaths)

The percentage of footpaths within a territorial authority district that fall within the level of service or service standard for the condition of footpaths that is set out in the territorial authority's relevant document (such as its annual plan, activity management plan, Activity Management Plan, annual works programme or long term plan).

Performance measure 5 (response to service requests)

The percentage of customer service requests relating to roads and footpaths to which the territorial authority responds within the time frame specified in the long term plan.

The associated Customer Levels of Service for each category have been developed to reflect the 6 'fit-for-purpose' outcomes.

Mobility

Comprising 3 aspects:

- **Reliability** | the consistency of travel times that road users can expect
- **Resilience** | 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
- **Speed** | indicates the optimal speed for each road. The optimal speed is the speed that is appropriate for road function (classification), design (including safety) and use. Optimal speeds support both safety and economic productivity

Safety

How road users experience the safety of the road.

Amenity

The level of travel comfort experienced by the road user and the aesthetic aspects of the road environment (e.g., cleanliness, comfort/convenience, security) that impact on the travel experience of road users in the road corridor.

Accessibility

The ease with which people are able to reach key destinations and the transport networks available to them, including land-use access and network connectivity.

2.2 Technical levels of service

The current One Network Road Classification (ONRC) framework is being substantially enhanced through implementation of its successor, the One Network Framework (ONF). Council has previously embedded ONRC performance measures in its assessment, reporting and setting Level(s) of Service accordingly.

A number of performance measures continue to be reported under ONRC classifications whilst this transition is underway. In addition, the Differential Level of Service approach, multi-modal network layers and future state planning approaches integral to the ONF are still in development.

Council will therefore continue to use ONRC and its technical Levels of Service to manage and assess network performance towards 2027. At the same time Council will undertake ‘parallel’ assessments using ONF measures as they are cemented, gaining comprehensive insight into the impacts and opportunities made possible by encapsulating the ONF in relation to the ONRC.

The ONF is a road classification tool which uses place and movement functions to categories roads on the network, with a stronger emphasis on place. It classifies the network into rural or urban (based on land use) and assigns a place (based on activity and physical form) and movement (based on traffic volume) function to the network.

It is anticipated the ONF will form the basis of the next AMP, as well as its performance measurement system DLoS, the successor of the CLoS system. It is important to reiterate that the DLoS performance measures are still under development at this time.

2.2.1 General traffic classification

The ONRC hierarchy utilises a General Traffic (GT) classification (based primarily on traffic volume) for a network’s roads, which correlates with categories ranging from Access (Low Volume) to National (High Volume). The following table details the classifications relevant to MDC and highlights the expected Level(s) of Service for Mobility, Safety, Amenity, and Accessibility discussed earlier.

Fit for purpose Customer Levels of Service (CLoS) outcomes aligned to General Traffic Classification within the One Network Framework (Applicable classifications to MDC displayed only)

		Mobility			Safety	Amenity	Accessibility
ONRC	General Traffic Classification	Travel time reliability	Resilience	Optimal speeds			
Arterial	4	Generally, road users experience consistent travel times with some exceptions in urban heavy peak, holidays, during major events or during moderate weather events	Route is nearly always available except in major weather or emergency events and where no other alternatives are likely to exist. Clearance of incidents affecting road users will have a high priority. Road users may be advised of issues and incidents	Higher speeds depending on assessed level of risk. Lower if mixed use, high intersection density, schools, shopping, concentrations of active road users. In urban areas travel speeds depend on assessed level of risk and recognise mixed use, schools, shopping strips and concentrations of active road users	Variable road standards, lower speeds and extra care required on some roads/sections particularly depending on topography, access, density and use. Road user safety guidance provided at high-risk locations. Some separation of road space for active road users in urban areas	Good level of comfort, occasional areas of roughness. Aesthetics of adjacent road environment reflects journey experience needs of both road users and land use. Urban arterials reflect urban fabric and contribute to local character. Some separation of road space for active road users for amenity outcomes in urban areas. Clean and secure	Some land-use access restrictions for road users, both urban and rural. Road user connection at junctions with National, Arterial or Collector roads, and some restrictions may apply in urban areas to promote Arterials. Traffic on higher classified roads generally has priority over lower order roads. Some separation of road space for active road users in urban areas to provide network access and journey continuity. Extra care required around activity centres due to mixed use, including goods vehicles. Provision of quality information relevant to Arterial road user needs
Primary Collector	5	Generally, road users experience consistent travel times except where affected by other road users (all modes) or weather conditions	Route is nearly always available except in major weather or emergency events and alternatives may exist. Clearance of incidents affecting road users will have a moderate priority. Road users may be advised of issues and incidents	Travel speeds depend on assessed level of risk and recognise mixed use, schools, shopping strips and concentrations of active road users	Variable road standards and alignment. Lower speeds and greater driver vigilance required on some roads/sections particularly depending on topography, access, density and use. Active road users should expect mixed use environments with some variability in the road environment, including vehicle speed. Road user safety guidance provided at high-risk locations	Moderate level of comfort, occasional areas of roughness. Aesthetics of adjacent road environment reflects journey experience needs of all road users and adjacent land use. Urban collectors reflect urban fabric and contribute to local character. Specific provision where active road users present. Clean, safe and secure	Land use access for road users generally permitted but some restrictions may apply. Road user connection at junctions with Arterial or Collector roads, and some restrictions may apply in urban areas to promote Arterials. Traffic on higher classification roads generally has priority over lower classification roads Active road users should expect mixed use environments with some variability in the road environment, including vehicle speed. Provision of quality information relevant to Collector road user needs
Secondary Collector	6	Road users travel times may vary as a result of other road users (all modes), weather conditions or the physical condition of the road	Generally, road users experience consistent travel times except where affected by other road users (all modes) or weather conditions		Variable road standards and alignment. Lower speeds and greater driver vigilance required on some roads/sections particularly depending on topography, access, density and use. Active road users should expect mixed use environments with some variability in the road environment, including vehicle speed. Road user safety guidance provided at high-risk locations	Moderate level of comfort, longer areas of roughness. Aesthetics of adjacent road environment reflects journey experience needs of all road users and adjacent land use. Urban collectors reflect urban fabric and contribute to local character. Specific provision where active road users present. Clean, safe and secure	Land-use access for road users generally permitted but some restrictions may apply. Road user connection at junctions with other Collectors or Access roads. Collector road traffic generally has priority over Access road traffic. Active road users should expect mixed use environments with some variability in the road environment, including vehicle speed. Provision of quality information relevant to Collector road user needs
Access	7	Road users experience varied travel times as a result of other road users (all modes), weather conditions or the physical condition of the road	Route may not be available in moderate weather events and alternatives may not exist. Clearance of incidents affecting road users and road user information will have a lower priority		Variable road standards and alignment. Lower speeds and greater driver vigilance required on some roads/sections particularly depending on topography, access, density and use. Active road users should expect mixed use environments with some variability in the road environment, including vehicle speed. Road user safety guidance provided at high-risk locations	Lowest level of comfort may include extended areas of roughness and unsealed surfaces (on rural roads). Aesthetics of adjacent road environment strongly reflects land use and place function. Strong shared philosophy between active road users (if present) and vehicular traffic. Active road users expect environment appropriate to their needs. Urban areas clean, safe vehicle speed and secure lighting	Access to all adjacent properties for road users. Road user connection at junctions ideally with Collectors and other Access roads. Access road traffic generally has lower priority over traffic on all higher classification roads. Active road users should expect mixed use environments with some variability in the road environment, including vehicle speed. Enhanced accessibility and provision of quality information
Access (low Volume)	8		Route may not be available in moderate weather events and alternatives may not exist. Clearance of incidents affecting road users and road user information will have the lowest priority				

2.2.2 Frequency of inspections and response times for works

2.2.2.1 Physical works | Response times

All specified response times are measured from either:

- Engineer notification, or
- Contractor observation, whichever occurs first.

For work items with set response times or determined by the Engineer by instruction or agreement with the Contractor or by approval of the Contractor programme, the response times will apply unless the Contractor has been advised otherwise by instructions or approval of any programme.

2.2.2.2 Network inspections

Contractor's Regular Inspection Schedule

General Traffic Classification (with related ONRC Class)		Frequency
GT1 - GT4	(High Volume, National, Regional, Arterial)	Weekly
GT5 - GT6	(Primary Collector, Secondary Collector)	2-Weekly
GT7 - GT8	(Access, Low Volume)	Monthly

Culvert & Stormwater Structures Inspection Schedule

General Traffic Classification (with related ONRC Class)		Frequency
GT1 - GT8	(All Classes)	6-Monthly

Bridge Inspection Schedule

General Traffic Classification (with related ONRC Class)		Frequency
GT1 - GT8	(All Classes)	Annual

Night-time Inspection Schedule

General Traffic Classification (with related ONRC Class)		Frequency
GT1 - GT5	(High Volume, National, Regional, Arterial, Primary Collector)	Annual
GT6	(Secondary Collector)	2-Yearly
GT7 - GT8	(Access, Low Volume)	3-Yearly

Final Inspection

General Traffic Classification (with related ONRC Class)		Frequency
GT1 - GT8	(All Classes)	Last 2 months of Contract Period

2.2.2.3 Response times

Crash Reports

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT8	(All Classes) | Initial report	24 Hours
GT1 - GT8	(All Classes) | Detailed report	14 Days

Incident Response

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT8	(All Classes) | Initial / single response	2 Hours
GT1 - GT8	(All Classes) | Commence work	14 days

Surface Defects | Sealed Roads

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT8	(All Classes) | Bleeding bitumen	Refer to Road Maintenance Contract | Section 3, WC111: Sealed Pavement Maintenance
GT1 - GT8	(All Classes) | Other defects	As per the approved programme

Digouts | Sealed Roads

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT8	(All Classes) | Failures affecting traffic safety and showing signs of rapid deterioration	1 Day
GT1 - GT8	(All Classes) | Failures not affecting traffic safety but showing signs of rapid deterioration	5 Days
GT1 - GT8	(All Classes) | Other pavement failures	As per the approved programme

Deformation | Sealed Roads

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT8	(All Classes)	As per the approved programme

Potholes | Sealed Roads

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT4	(High Volume, National, Regional, Arterial)	1 Day
GT5 - GT6	(Primary Collector, Secondary Collector)	2 Days
GT7 - GT8	(Access, Low Volume)	3 Days

Edge Break | Sealed Roads

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT8	(All Classes)	As per the approved programme

Service Covers | Sealed Roads

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT8	(All Classes)	As per the approved programme

Unsealed Shoulders | Sealed Roads

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT8	(All Classes)	As per the approved programme

Pavement Marking | Sealed Roads

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT8	(All Classes) | New marking, additional marking, removal of redundant marking and installation of new RRPM's	As programmed

Maintenance | Unsealed Roads

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT8	(All Classes) | Areas with multiple potholes	2 Days
GT1 - GT8	(All Classes) | Areas with isolated potholes	5 Days
GT1 - GT8	(All Classes) | Pavement failures affecting traffic safety and showing signs of rapid deterioration	1 Day
GT1 - GT8	(All Classes) | Pavement failures NOT affecting traffic safety and showing signs of rapid deterioration	5 Days
GT1 - GT8	(All Classes) | Other pavement failures	As per the approved programme
GT1 - GT8	(All Classes) | Deformations	As per the approved programme
GT1 - GT8	(All Classes) | Grading	As per the approved programme
GT1 - GT8	(All Classes) | Subgrade exposure and slippery conditions where road user safety is at risk	1 Day
GT1 - GT8	(All Classes) | | Other defects	As per the approved programme

Barrier Repair | All Roads

General Traffic Classification (with related ONRC Class)		Response Time
GT1 - GT8	(All Classes) | Removal of offensive graffiti	1 Hour
GT1 - GT8	(All Classes) | Removal other graffiti	5 Days
GT1 - GT8	(All Classes) | Cleaning to restore visibility to barriers	5 Days
GT1 - GT8	(All Classes) | Replacement & painting (where required) of defective or damaged barriers where traffic or public safety is seriously compromised	2 Hours (to make safe, temporary) 2 Days (Permanent repair)
GT1 - GT8	(All Classes) | Replacement & painting (where required) of defective or damaged barriers where traffic or public safety in NOT seriously compromised	2 Hours (to make safe, temporary)
GT1 - GT8	(All Classes) | Other defects	As per the approved programme
GT1 - GT8	(All Classes) | New installations	As per the approved programme

Slip Removal | All Roads

General Traffic Classification (with related ONRC Class)		Response Time
GT1 - GT8	(All Classes) | Slips greater than 10m^3, and/or impacting on roadside drainage, carriageway width and motorist safety	Refer to 'Incident Response' above
GT1 - GT8	(All Classes) | Slips 10m^3 or less, not impacting on roadside drainage, carriageway width and motorist safety	1 Month

Kerb & Channel | All Roads

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT8	(All Classes) | Making safe dangerous areas	As per the approved programme

Drainage Systems | All Roads

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT4	(High Volume, National, Regional, Arterial)	1 Day
GT5 - GT6	(Primary Collector, Secondary Collector)	2 Days
GT7 - GT8	(Access, Low Volume)	3 Days

Footpaths | All Roads

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT8	(All Classes) | Making safe dangerous areas	4 Hours
GT1 - GT8	(All Classes) | Other defects	As per the approved programme

Traffic Signs & Road Furniture | All Roads

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT8	(All Classes) | Cleaning signs	During patrol
GT1 - GT8	(All Classes) | Removal of offensive graffiti	1 Hour
GT1 - GT6	(High Volume, National, Regional, Arterial, Primary Collector, Secondary Collector) | Removal other graffiti	2 Days
GT7 - GT8	(Access, Low Volume) | Removal other graffiti	5 Days
GT1 - GT6	(High Volume, National, Regional, Arterial, Primary Collector, Secondary Collector) | Straightening/securing signs	2 Days
GT7 - GT8	(Access, Low Volume) | Straightening/securing signs	5 Days
GT1 - GT8	(All Classes) | Painting of posts	As per the approved programme
GT1 - GT4	(High Volume, National, Regional, Arterial) | Repair / replacement of REGULATORY signs	4 Hours
GT5 - GT6	(Primary Collector, Secondary Collector) | Repair / replacement of REGULATORY signs	1 Day
GT7 - GT8	(Access, Low Volume) | Repair / replacement of REGULATORY signs	2 Days
GT1 - GT8	(All Classes) | All other work	As per the approved programme

Vegetation Control | All Roads

General Traffic Classification (with related ONRC Class)		Frequency
GT1 - GT8	(All Classes) | Chemical, high vegetation & exotic seedling control	As required to meet standards specified
GT1 - GT8	(All Classes) | Mowing duration (as specified)	Each mowing round to be completed within 6 weeks of commencement
GT1 - GT8	(All Classes) | Mowing frequency	4 Rounds per annum, timings agreed with the Engineer. Demand varies according to seasonal growth rates
GT1 - GT8	(All Classes) | Mowing specification	Maximum height of freshly mown grass – 75mm

Litter, Graffiti & Detritus Removal | Rural Roads

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT8	(All Classes) | Removal of offensive and dangerous litter (e.g., dead animals, vomit, excrement, broken glass, etc)	4 Hours
GT1 - GT8	(All Classes) | Removal of other litter	3 Days
GT1 - GT8	(All Classes) | Removal of offensive graffiti	1 Hour
GT1 - GT8	(All Classes) | Removal of other graffiti	5 Days

Street Cleaning, Litter, Graffiti & Detritus Removal | Urban Roads

General Traffic Classification (with related ONRC Class)		Response time
GT1 - GT8	(All Classes) | Removal of offensive and dangerous litter and debris (e.g., dead animals, vomit, excrement, broken glass, etc)	1 Hour
GT1 - GT8	(All Classes) | Removal of other litter & debris	By 8:00am of the day following
GT1 - GT8	(All Classes) | Removal of offensive graffiti	1 Hour
GT1 - GT8	(All Classes) | Removal other graffiti	By 8:00am of the day following
GT1 - GT8	(All Classes) | Special cleaning for events	As per approved programme or instruction to Contractor

Regular Litter Removal (Patrols) | All Roads

General Traffic Classification (with related ONRC Class)		Frequency
GT1 - GT4	(High Volume, National, Regional, Arterial) | Litter removal	Weekly (auditable schedule)
GT5 - GT6	(Primary Collector, Secondary Collector) | Litter removal	Twice monthly (auditable schedule)
GT7 - GT8	(Access, Low Volume) | Litter removal	Monthly (auditable schedule)

Urgent Response | All Roads

General Traffic Classification (with related ONRC Class)		Response time
GT1 – GT8	(All Classes) | Any litter or detritus on the carriageway of footpath impacting on traffic/pedestrian safety or flow (e.g., broken glass, diesel spills, etc)	Immediate

2.2.2.4 Timeframes for deliverables

Rehabilitations

Deliverable
Refer to Road Maintenance Contract | Section 25, WC214.1 and Section 26, WC214.2 to 214.7

Reseals

Deliverable	*Delivery By:*
Reseals Programme supplied to the Contractor	15 May for the following financial year of construction
Contractor to provide design reports for each section of road detailed in the programme, along with a priced schedule and works programme (based on the tendered schedule)	30 August
Commencement of annual chip sealing physical works	After 1 November but dependent on suitable weather conditions and with prior approval from the Engineer
Completion of annual chip sealing	Northern Area (all roads north of a line across the district approximately between Pōhangina and Cheltenham, as agreed with the Engineer) – 28 February Southern Area (all other roads) – 31 March
Completion Report	30 April

2.2.2.5 Faults, levels of service and response times

The Contractor is required to undertake network inspections to maintain the levels of service specified in the contract. Additional monitoring and surveillance is carried out by the Council's roading staff and this is used to determine trends and to monitor performance.

Fault	*Level of Service*	*Response Time*
Potholes – Sealed Road	There shall be no potholes exceeding 30mm in depth in chip seal surfaces, 60mm in depth in Asphaltic Concrete or other porous surfaces, or 120mm diameter in all bituminous surfaces	The Contractor shall inspect all roads and programme the necessary work to ensure that the specified level of service is met at all times All work undertaken shall be recorded and reported through the specified Achievement Reports.
Surfacings	There shall be no surface defects that either present a traffic safety hazard or compromise the integrity of the pavement	The work shall be carried out to meet the specified timeliness, programming and quality parameters
Digouts – Sealed Roads	Repair of failures shall be carried out on sealed roads as approved by the Engineer	All works shall be completed to the following time frames: Priority Response Pavement defects that may cause a safety hazard to vehicles or where the pavement surface has broken, and rapid deterioration is evident – within 1 working day of identification General Programming Pavement defects with the potential to deteriorate rapidly under traffic loading and/or adverse weather – within 5 working days of identification Pavement defects with the potential to deteriorate over the next 30 days – within 30 working days of identification
Deformations	Repair of surface depressions shall be carried out on sealed roads on the approval of the Engineer	In the case of Ordered Works, the work shall be carried out to meet the specified timeliness and quality parameters, including all surfacing and reinstating pavement marking and raised pavement markers
Edgebreak	There shall be no edge break exceeding 100mm from the nominal edge of seal or encroaching onto the white edge line	The Contractor must complete all edge break repairs, including all surfacing and reinstating pavement marking and raised pavement markers, in accordance with the specified timeliness and quality parameters
Unsealed Shoulder	There shall be no: Edge rutting exceeding 30mm in depth Potholes exceeding 200mm in diameter or 35mm in depth Deviation from the widths and crossfalls of the shoulders, feather edges, and tapers High shoulders that would cause ponding of water on the sealed carriageway either during or after rainfall	The Contractor shall inspect all sites and programme the necessary work to ensure that the specified level of service is met at all times
Potholes - Unsealed Roads	There shall be no pothole exceeding 35mm in depth or 200mm in diameter on an unsealed road	The Contractor shall inspect all sites and programme the necessary work to ensure that the specified level of service is met at all times
Digouts - Unsealed Roads	Repair of failures shall be carried out on unsealed roads on the approval of the Engineer as soon as practical so as not to jeopardise the safety of the travelling public. Repaired digouts shall produce a smooth riding surface of no lesser quality than the balance of the road for the duration of the contract	The Contractor shall inspect all sites and programme the necessary work to ensure that the specified level of service is met at all times
Unsealed Surface and Shape	The running surface of the road shall remain smooth with a safe and acceptable shape, true to grade. (Further levels of service specific to faults are specified in the contract)	The Contractor shall inspect all sites and programme the necessary work to ensure that the specified level of service is met at all times

Maintenance requirements for culvert and bridge repairs are discussed later in the Drainage and Bridge Sections.

3.0 Demand

3.1 Asset impact

3.1.1 Asset context and achievements to date

The district's land transport network is a core strategic facility and is maintained (excluding state highways) by the Council to assist it in meeting its Community Outcomes. It provides particularly strong inputs into the achievement of Community Outcomes.

New infrastructure has been continually added to the network from new urban Subdivisions since the District was established in 1989, reflecting the high population growth rates over that period. The majority of new urban infrastructure is vested at no initial cost to the Council by private developers, however the Council is then responsible for the on-going maintenance and renewal of this infrastructure in perpetuity.

3.1.2 Changes in the level of service demanded by the road users

Over time, communities tend to expect improving service from their assets. Agreed levels of service for roads, and the activities involved in managing the roads, will help to control this tendency but level of service may nevertheless need to be improved to satisfy these future needs. The trend to more lifestyle blocks in the countryside has also changed the expectation of the travelling public in rural areas where rural roads are no longer used only by local farmers, but now carry a much wider range of people and vehicle types. This has resulted in factors such as smoothness of ride, loose metal, dust and higher speeds becoming more important to more road users.

Similarly, more people wish to cycle, and to have safe alternatives to cycling, on the district's typically narrow rural roads. These people seek wider carriageways, cycle lanes and off-road pathways to address their needs.

Increases in fuel costs will put pressure on the Council to provide or facilitate more affordable and sustainable transport solutions for the district's residents. This may require additional public transport services, and an investment in walking and cycling infrastructure to cater for short trips — and even longer commuter trips to Palmerston North. However, there are disconnections between what can be realistically provided in the district's urban and rural areas and in the nearby areas of Palmerston North City.

3.1.3 Changes in the strategic management of the assets

The Council's policies and management strategies are continually evolving to keep pace with the changing needs of the community, statutory requirements, funding organisations and central government's requirements. Changes to policies and management strategies can also have a significant effect on how assets are managed

The directions of future land use changes and their effects on the roading network are always difficult to determine with accuracy, but it is important that the roads likely to be affected are identified and prepared in readiness for these changes at the appropriate times, before levels of service degrade too far. More importance is being placed on the integration of land use and transportation systems to provide long-term sustainable solutions. The Council is actively involved in regional strategic planning initiatives to help it assess and plan for the demands of further growth in a sustainable way, across all its assets and responsibilities, including the transportation network.

Demand for new or upgraded facilities arises from the needs of the existing population i.e., meeting the level of service standards, changing habits, and population growth. This demand manifests itself in the need for:

- New roads
- Sealing of unsealed roads
- Widening and alignment improvements
- Upgraded intersections
- New and upgraded bridges
- Appropriate urban facilities in closely settled areas, e.g., streetlights, kerb and channel, footpaths
- New cycleways and walkways.

The Council intends to maintain its awareness of these issues and plans to provide a transportation network that meets the communities' expectations. This will involve implementing improvement projects, walking and cycling lanes, seal widening and selected public transport infrastructure facilities in conjunction with routine maintenance and renewal of its roading network.

The funding of all these works has been recognised in the financial forecasts in this Plan and will be utilised in the formulation of Manawatū's LTP.

3.2 Management planning

3.2.1 Plan change 27

This provides for the strategic residential growth of the North-eastern part of Feilding, Plan change 45 being the precincts boarding the west and north of Feilding, and the operative change 52 for the industrial area of Feilding. The broad objective and policy framework put in place by the Plan Changes will manage business as well as residential growth, however the zoning of specific blocks of land primarily relates to new residential development areas around each of the existing Feilding township. Outline Development Plans (ODPs) have been developed for inclusion into the District Plan as part of the plan change process. These seek from the outset to achieve good urban design and sustainable outcomes by establishing how each block will spatially develop across all infrastructural assets, and how these developments will link to existing and other new areas. One of the key elements required to be shown on the ODPs are roading, walking and cycling routes and networks.

3.2.2 Minor improvements

The funding of improvements is catered for in the subsidised National Land Transport Programme under Activity Class: Local Road Improvements. This Activity Class includes NZTA Work Categories 216, 322 to 325, and 357 and can include substantial projects such as new bridges, and new roads, in addition to road reconstructions. Individual projects generally have to meet assessment criteria under NZTA's Evaluation Manual(s) to be eligible for funding.

Safety related improvements accesses funding through Work Category 341. Safety related improvement projects up to a value of $2,000,000 per project can be funded from this category. Historically, Council would anticipate availability of funding commensurate to 5% of the value of its Maintenance and Renewal Programme. This equated to approximately $500,000 per annum. Since 2021, Council must discuss with - and have approved - all Road Safety projects by NZTA, reporting delivery status on a frequent basis.

Council operates Hazards and Deficiency Databases that list and prioritise projects for funding from this allocation.

Wherever possible, the Council utilises subsidised funding sources to carry out major works. If major transportation projects are not eligible for subsidised funding, Council then considers fully funding these as projects in order to achieve them. Council's Hazard and Deficiency Databases are used to evaluate and rank projects based on a risk reduction, traffic and cost basis.

As part of the development of these databases, consideration was extended to intersection lighting, intersection seal-backs and other safety-related projects that were not previously considered for funding in this manner. Other projects are regularly put forward for inclusion following identification through the work of the Council's Transport and Road Safety Coordinator. As a consequence of these changes, a number of similar projects, of a relatively low cost, were ranked at the top of the list of projects. The Council decided to spread the work over a number of work types to achieve some degree of parity both on the type of work and how it is distributed across the network and District in a more equitable manner, this has meant that the priorities determined by the deficiency database processes are not rigidly followed.

3.2.3 New improvements planning

The LTP process stipulated by the LGA 2002 requires the Council to plan and forecast its activities for long periods into the future, and to publish and consult on its intentions at 3-yearly intervals. In the periods between LTP's it is required to follow a simpler Annual Plan procedure. There is no real scope under this system for making significant changes to major LTP programmes at Annual Plan time unless there are exceptional circumstances.

The Land Transport Management Amendment Act 2008 introduced a requirement for RCA's to prepare three-yearly Land Transport Programmes. However, the requirement for territorial local authorities to do so is only an indirect one in that major projects need to be prioritised and co-ordinated on regional basis in order to obtain funding from the NLTP and a RLTP is required as an input to the NLTP. The RTC performs this prioritisation task and achieves the regional consensus necessary to develop and confirm the Regional Land Transport Programme.

The Council operates a Projects Database that lists potential individual improvement projects from sources such as township committees or community boards, staff and councillors. These requests may also arise from public enquiries and projects not usually expected to be contained in other forward more formal programmes (e.g., seal extensions and seal widening programmes). Typically, these requests are associated with township renewal and improvement works such as footpath extensions, new kerb and channel, individual streetlights and street upgrades. Renewal recommendations are not part of this process, other than their interaction with street upgrading in some instances.

3.2.4 Local priorities

As part of the development of LTP, the District's communities, via their respective Community Committees, are provided the opportunity to rank proposed improvement projects in order of their preferences. These preferences are then considered by the Council in the preparation of the LTP and Annual Budgets. Usually, these proposals include mainly minor improvement works, like footpath extensions and new streetlights; however, other works such as street upgrades, that strictly speaking are renewal works, are included to simplify the consultation and consideration processes and to ensure that the communities are fully informed.

Where roading projects are likely to be approved as part of the NLTP, they are incorporated into the Council's Land Transport Programme. The proposed Land Transport Programme is approved by the Council before submission to the NZTA.

Wherever possible the Council utilises subsidised funding sources to carry out major works. If major transportation projects are not eligible for subsidised funding, the Council then considers fully funding these as projects in order to achieve them. A Hazard and Deficiency Database is used to evaluate and rank projects based on a risk reduction, traffic and cost basis.

As part of the development of this database, consideration was extended to intersection lighting, intersection seal-backs and other safety-related projects that were not previously considered for funding in this manner. Other projects are regularly put forward for inclusion following identification through the work of the Council's Transport and Road Safety Coordinator. As a consequence of these changes, a number of similar projects, of a relatively low cost, were ranked at the top of the list of projects. The Council decided to spread the work over a number of work types to achieve some degree of parity both on the type of work and how it is distributed across the network and District in a more equitable manner, this has meant that the priorities determined by the deficiency database process are not rigidly followed.

There is also a need to be financially prudent on what funding can be provided to the township/roading programme to ensure future rates movements minimised. The simplest way to minimise rate movements (increases) is to minimise the capital spend on items that are discretionary in nature.

Accordingly, there is no discretionary funding included in the LTP at this draft stage. Once it is known what the core general rates/funds are, Council may be able to provide some form of discretionary project funding.

3.2.5 Subdivision commitments

The nature of subdivision developments, and the corresponding needs for subdivision commitment expenditure, can be difficult to define and predict over a 10-year programme period. This also comes about from the large differences in lead times between receipt of proposals for major developments and their practical completion.

Subdivision commitments can only be determined on a case-by-case basis once applications are lodged and approved. Consent conditions, under the Resource Management Act 1991, requiring financial contributions for roading upgrades conditions can be contested by the developer. The time taken to work through these processes can present a problem in forecasting the works and finance required to meet them. The approach taken in this Plan to address this problem is to:

- Programme specific works when they are confirmed and quantified
- Programme indicative finance where specific works or projects are not yet identified or quantified
- Base financial projections on constant-dollar historical expenditures on subdivision commitment works, tempered by consideration of the Council's accepted growth predictions for the various towns and localities within the district.

While predicted growth discussed above refers to people, it is expected that average dwelling-occupancy rate will continue to decline over resulting in the numbers of dwellings increasing at a slightly faster rate than the residential population over the period.

Trip generation is typically modelled on the number of trips generated per household, which for assessment purposes currently ranges between 6 and 10 trips per day. Another recent influence is that most households in the district now have more than one vehicle. Therefore, trip generation or traffic growth is expected to increase faster than the population. An aim of initiatives like

Travel Demand Management (TDM) is to manage the increase in trips by facilitating non-car based solutions such as walking and cycling, and public transport.

3.2.5.1 Assumptions

It is reasonable to assume that the Council will need to fund a share of subdivision road works related to development in about the same proportions as present. However, despite the uncertainty surrounding prediction of subdivision commitments discussed above, some of the commitments in the immediate years (years 1 to 2 and possibly 3) of the programme are known, because of the lead-times between receipt of proposals for major developments and their practical completion. These known projects will be programmed as specific items in the forward programme while retaining a lesser provision for currently unknown commitments.

The demographic changes around dwelling occupancy will have only a very small effect on the total number of dwellings required in the short to medium term; and as far as the forecasting of subdivision commitment funding is concerned, they can reasonably be ignored.

3.2.5.2 Development contributions

Development contributions are contributions required from developers to help offset the effects of growth they have induced on the network. They are levied under the LGA 2002 and Council's Development Contribution Policy.

Financial contributions are amounts or works required of developers to avoid, remedy or mitigate the adverse effects of their developments on the environment, built or natural. They are levied under the Resource Management Act 1991

Works that include a growth component can be considered for a development contribution; based on the cost of providing additional capacity for growth. Providing additional capacity for an enhanced level of service as well may still attract a growth component, but it will be of a lesser proportion.

At the time of writing of this Plan, there are no financial or development contributions for growth related work outside the immediate environs of proposed development.

Financial Contributions are levied for specific works that need to be carried out on roads adjacent to new developments, where the standard of the road is inadequate for the development. The costs of these works are shared with the Council, based on projected traffic volumes.

3.2.5.3 Subdivision approvals and commitments

Roads, because of their fundamental role in providing access to and from, and often within, properties, are directly affected by changes in land use and subdivisions. Some of these affects may be very minor and some can be significant either locally or at a network level.

Subdivisions reflect the underlying land use zoning. If the zoning status of land changes, through the Manawatū District Plan or private plan changes, this can result in areas being subdivided and developed for residential, rural residential, business/commercial and industrial purposes. This can drive the requirement for existing roads and streets to be upgraded and new infrastructure to be constructed and vested in the Council.

Developers usually pay the full cost of roading and development works within new subdivisions. However, when the Council anticipates that a proposed local road will have wider use in network, such as a collector or arterial road, it will contribute towards the incremental cost of any additional width.

New roading assets are vested in the Council upon completion of the subdivision and the issuing of titles to the new lots. The Council, as ultimate owner and operator of these assets, specifies minimum design criteria and checks construction at critical stages.

This process requires developers inter alia to obtain engineering approval for the proposed works from Council staff prior to construction. This includes providing fully detailed plans and specifications for the approval. Not until approval is obtained can physical construction work, including roading, street lighting, and utilities installation and construction, proceed.

The Developer must have all completed works inspected and approved by the Council before a Section 224(c) Certificate is issued. When the certificate is issued the new assets are vested in Council.

New roads and other associated infrastructure like footpaths, streetlights etc are recorded and added to the RAMM network inventory upon receipt of the assets from the developer.

Where a new development fronts an existing legal road, improvements will often be needed to be made to it; sometimes improvements are required to other parts of the wider network, separate from the subdivision. These improvements can include footpaths, kerb and channel, access improvements, increased seal width, and improved sight lines and improvements to adjacent intersections.

For each development, the Council considers the need for roading improvements directly associated with the subdivision and, where improvements are justified; engineering staff seek to have appropriate conditions inserted in the relevant consents. These can be established and applied through either the Resource Management Act 1991 (to avoid, remedy or mitigate the adverse effects of a particular development) as Financial Contributions.

The Council prefers to utilise its development contribution policy, introduced in the 2006 Long Term Council Community Plan, for establishing upgrading contributions for any improvements remote from the subdivision.

Under the provisions of these Acts, and case law, the Council is often not able to require a developer to pay the full cost of an upgrade to an existing road and is required to share the cost of the works. In some cases, the Council will apportion costs on the basis of contributing traffic, however generally a minimum 50% contribution is sought as it would be inappropriate for the Council to commit itself to significant expenditure on the basis of a low contribution.

Existing roads are upgraded as a result of new subdivisions or changes in land use if the additional traffic generated is significant enough to warrant a contribution being imposed on the developer to mitigate its adverse effects on the network.

Until recently, the nature of subdivision development was that the Council had little, if any, control over the timing or implementation of any project. Recent strategic planning initiatives such as the greater Feilding Urban Growth Framework are attempting to control the amount and staging of growth ensure that it, and the supply of supporting infrastructure, is sustainable and achievable.

The development of Structure Plans have provided greater certainty in the urban form likely to develop and deemed appropriate. This enables coordinated planning to occur and opportunities for lead infrastructure to be provided by Council and funded by development contributions (e.g., Lowes Road).

3.2.5.4 Subdivision development

Developers pay the full cost of development within new subdivisions, with new assets being vested in Council upon completion and the issuing of subdivision titles. However, on-going maintenance and renewal of the new roads and associated assets built in these developments is the responsibility of the Council.

Improvements will often be made to the existing road network in association with subdivision, for example new footpaths and kerbs and channels, access improvements, increased seal width, improved sight lines, etc. Typically, these are works that are directly associated with the subdivision itself, and have been 50% Council funded, 50% developer funded.

The policy for development contributions that may be charged for future subdivisions is established at a Council wide level, as provided for under the LGA 2002 and Development Contribution Policy.

3.2.5.5 Level of service improvements

From time to time significant safety problems arise at particular points on the network. For example, the severity or number of crashes at a particular intersection might increase to the extent that a major improvement project is necessary and justified.

On existing roads these types of interventions are generally not considered improvement backlogs; rather, they are usually newly justified improvement works. However, they could form part of a backlog if they have been identified for longer than it would usually take to programme and fund a new project and remain programmed. As discussed, eligible projects up to a cost of $2,000,000 can be funded through a block allocation in the Council's subsidised Land Transport Programme.

3.2.5.6 Programming level of service improvements

The new improvement programmes reflect a balance between what is affordable and what is achievable with the funding currently, or expected to be, available.

Most road network level of service gaps are known and are relatively small in the context of the whole network. These are compensated for in the day-to-day administration of the asset. When this cannot occur, additional funding is sought to address the gap. This normally occurs when the Council's Land Transport Programmes is compiled and submitted to NZTA for approval. However, NZTA usually requires any such requests to be "evidence based" before approving additional funding.

The Improvement Plan includes a number of individual tasks over sub-asset groups to review and identify any potential level of service backlogs that are outside normally acceptable time variances/ lead times.

3.2.5.7 Significant land use changes

Council periodically undertakes a review of the District Plan. One of the initial parts of the review involves consideration of urban growth requirements around Feilding. A total of four residential growth precincts and one industrial growth precinct are currently identified in the Feilding Urban Growth Framework Plan.

To date Precincts 1 (one), 2 and 3 from the framework plan have been through the public plan change process under the Resource Management Act (1991). These areas are located to the west of Feilding, and detailed structure plans have been prepared. The combined total yield of three precincts is 1,860 new residential lots at minimum lot sizes between 800m^2 and 2,000m^2. The expected yield will result from some rezoning completed immediately and from areas identified for deferred zoning that will remain rural and be rezoned to residential as demand requires.

Further research and analysis is being undertaken on the additional residential growth precinct located around Pharazyn Street/Reids Line (Precinct 4) and the industrial growth precinct at Kaw5wa Road (Precinct 5). These areas will provide an additional yield of 1,600 residential lots and an additional 97ha for future industrial land use.

3.2.5.8 Planned upgrades

For roading the large majority of expenditure is on planned renewals and maintenance. The largest single project capital costs are to replace the bridge structures across the district as they reach the end of their useful lives. These renewals are programmed in over the next 30 years and beyond.

This strategy reflects the current upgrade programme in the short to medium term. As these infrastructure assets are long term investments the majority of investment required in the long term will be plant and pipe renewals, and forecast work required to lift standards in response to the renewal of resource consents.

Council also has a focus on economic development, and on ensuring the associated infrastructure capacity is available for commercial / industrial land and residential growth in Feilding. Plans for growth areas were developed through the Feilding Urban Growth Framework Plan and an ongoing review of the District Plan.

3.2.5.9 Summary

Council has the following long term strategy:

- Ensure rural townships are vibrant and thriving by providing affordable infrastructure with some spare capacity that meets current relevant mandatory and resource consent standards for quality and security of supply
- Maintain the existing roading network to current levels of service, including renewing bridges and other roading assets
- Gradually upgrade the quality of urban streets that need major renewals
- Meet new resource consent standards for Feilding and meet Manawatū River Accord commitments for all urban areas
- Ensure capacity is available to support the development of the wider Manawatū as Food HQ for New Zealand, and specifically food innovation and processing in the district
- Plan for the renewal of all assets as set out in the AMPs
- The current upgrade programme and the identified Feilding growth precincts will cater for forecast growth over the next 30 plus years
- Funding for the forecast expenditure and loans will fit within the Financial Strategy rating and debt limits for the first 10 years and will be consistent with the Financial Strategy funding strategies for years 11 to 30.

The main challenges facing the roading network are not related to traffic growth. Across the network there is considerable spare capacity to cater for additional traffic flows. The challenges relate more to:

- A legacy transportation network not envisaged to accommodate the demands of heavy traffic
- The impact of exotic forestry harvesting on remote rural roads
- Securing funding for network improvements
- Long term funding from NZTA for the current budgeted proportion of maintenance and renewal costs (not considered an issue in the medium term)
- Network classification frameworks introduced by NZTA have resulted in changes to levels of service
- Renewing the large number of bridges in the future

4.0 Lifecycle management plan

4.1 Background

4.1.1 Programme prioritisation and optimisation

Prioritisation is a method of putting proposals on a priority list indicating which are to be funded first.

Optimisation allocates resources to gain the most benefit or return possible in the given context. It focusses on evaluating what are considered to be the most important aspects of asset management. These aspects relate to minimising total life-cycle costs while meeting community and broader social expectations.

4.1.2 Aims of prioritisation and optimisation

In a generic economic sense, the option that minimises Council and road user costs, in a life cycle context, is considered to be optimal. An optimisation and/or prioritisation model is required to aid in the ranking of capital and maintenance projects to enable the optimum allocation of resources. In reality, this model will be indicative only and a number of iterations through the model may be required to achieve the final funding scenarios.

As well as minimising life cycle costs, the process of optimising and prioritising includes consideration of strategic network requirements and the accumulation of benefits from strategic corridor improvements. Prioritisation and various funding scenarios act interdependently through the planning and evaluation and the previous phases. The prioritisation and funding scenarios identify the forward works programme. The prioritisation and optimisation process is difficult when prioritising involves political decision making where questions such as those below must be answered:

Should higher priorities be given to the roads that contribute directly to the Region/District's economy? If benefits can be clearly demonstrated and quantified, the priorities of projects may be resolved by using Whole of Life Cycle Cost (WoLCC). However, this may not always be the case because it is not possible to quantify some community benefits

Should funding priorities be directed toward remote areas recognising the equity issues in transport? The concern is that the ONRC CLoS and Performance Measures for Low Volume Access Roads commit Council funding levels that may be politically unacceptable

Is it desirable to allow road conditions to deteriorate to meet ONRC CLoS and Performance Measures? In the short term it may be acceptable to allow deterioration provided the general road condition does not fall below the assigned CLoS. Some business rules may need to be developed to allow relatively small sections of these roads to exceed the assigned CLoS for short periods.

Priority ranking under budget constraints across:

- Budget heads
- Administrative areas
- Safety
- Transport network classifications / hierarchies

The above priority ranking may be complicated by the competition between political objectives and CLoS / Performance Measures.

4.1.3 Decision support systems

Council uses a variety of Decision Support Systems (DSS) which include:

- Gap analysis tools
- Economic evaluation tools
- Prioritisation and optimisation tools to assist in the development of the funding scenario and works programme
- Performance management tools
- Various levels of reporting requirements

4.1.4 Decision support levels

DSS support decision making at a number of levels of the activity management hierarchy. These levels are referred to as strategic, programme and project management levels. The activities and analysis involved in each of these levels are highlighted below.

4.1.5 Strategic level (NZTA)

- Policy analyses e.g., ONRC
- Setting standards
- Budget allocations
- Constrained 'top-down' network analyses
- Determine funding to meet policy and standards
- Receive budget requests, compare with funding
- Allocation of budgets

4.1.6 Programme level (Council)

- Gap analyses
- Identify pre-selected works
- Unconstrained 'bottom-up' sub-network analyses
- Prioritised and costed wish-list of works
- Budget request
- Formal submission of budget request to NZTA
- Receipt of budget allocation and condition standards
- Budget allocation by Work Category
- Divide allocated budget by Work Category
- Works programming by Work Category
- Constrained 'top-down' sub-network analyses

4.1.7 Project level (Council)

Selection of treatment options, e.g., detailed economic life cycle cost analyses.

4.1.8 Identification of asset requirements

The identification of asset requirements dictates the standards of performance, condition and capacity and the consequential funding requirements. It requires knowledge of existing asset performance and performance targets to identify the gaps in asset performance.

Performance measures of road assets are aligned with the One Network Roading Classification (ONRC) to deliver consistent community outcomes. Identified asset requirements must therefore correspond to the prescribed CLoS hierarchy taking into account community requirements and the existing network usage, configuration and condition. This involves collecting current condition/performance data and setting network performance targets/intervention criteria for each CLoS class so that performance gaps can be identified and rectified.

4.1.9 Customer level of service (CLoS) framework

CLoS is a term used to describe the quality of services provided by the asset for the benefit of the users. Depending upon the Road Classification a higher CLoS may be required for some parts of the network compared to others. Adopting the CLoS framework helps to achieve consistency in standards along roads of the same strategic importance. This has been identified as an important road user requirement and provides Council with an efficient systematic approach to managing their assets. The various CLoS have been defined by the Road Efficiency Group Te Ringa Maimoa (REG). Council is supporting this approach by implementing the ONRC and associated CLoS and Performance Measures.

4.1.10 Road hierarchy

The ONRC CLoS hierarchy has been developed by REG to define what class of asset is required. REG has taken the view that uniformly high operating conditions across all roads in the network are too costly to achieve and would not present an economic return on investment. On the other hand, it is impossible to manage an infinite number of standards and performance levels across the network. For this reason and for reasons of equity and transparency, all roads meeting a specific range of functional criteria should achieve a uniform CLoS. The criteria 'bins' to which road sections are assigned are the Road Classifications.

4.1.11 Functional classification

There are criteria and thresholds for each category, based on the functions the road performs within the network. To be included in a particular category a road must meet the agreed criteria and thresholds, including at least one of either; typical daily traffic (AADT), heavy commercial vehicles (HCV), or bus (urban peak) as appropriate.

4.1.12 Asset performance measures

Target road asset conditions (roughness, rutting, etc.) and road configuration parameters (width, lanes, etc.) have been defined for each CLoS / Roading Category. Performance measures are measurable targets with which current asset condition and configuration are objectively compared to determine road asset requirements. They are used to identify gaps in asset performance, which identify maintenance and/or capacity improvement activities.

Performance measures are defined using physical and dimensional parameters that reflect the operational and structural capacity of the asset. The configuration parameter targets represent the minimum acceptable levels. Condition parameters represent the health and condition state of the asset. The condition parameter performance targets represent the maximum acceptable levels, above which remedial actions are considered.

Targets for other aspects such as delineation, safety, availability, accessibility, reliability of travel times, congestion and environmental performance are aligned with a range of ONRC-Performance Measures.

The Performance Measures have been developed in conjunction with the ONRC and associated CLoS outcomes for each category of road the minimum (or maximum) acceptable configuration and condition parameters have been set.

Performance measures have also been set for an asset network as a whole. They are used to compare the network performance over a defined period, e.g., from year to year, and thus assess the effectiveness of the adopted activity management practices. For example, Efficiency, Safety, Resilience, Amenity, Travel time reliability, and Accessibility.

4.1.13 Community consultation

Implementing the ONRC, associated CLoS and Performance Measures as the basis for identifying asset requirements incorporates the informed view of the stakeholders and the rest of the community.

Council consultation with stakeholders and the community is a requirement of the LGA 2002 and is an essential part of the planning and policy development of the whole road system. Community consultation continues throughout the whole Integrated Activity management process. Formal community consultation is conducted in accordance with Sections 82 and 83 of the LGA 2002.

When conducting community consultation to determine acceptable intervention criteria for condition parameters, it is important to consider the distinction between the perceived condition of the asset as 'seen' by the users and the condition of the asset as determined by measurement and the analysis of condition data, particularly the structural condition of the asset.

4.1.14 Setting performance targets/intervention criteria

Council's performance targets/intervention criteria are set by legislative requirements, Council's investment objectives including equity, the ONRC and forthcoming ONF, associated LoS and Performance Measures, road user requirements (e.g., comfort, economy, and general ease of use), engineering and safety standards, economic analysis, existing road standards, historical performance trends and budgetary limitations. As a consequence, Council has developed strategies and makes policy choices regarding the degree to which an equity objective should be pursued to complement an economic efficiency objective when defining road outcomes.

4.1.15 Maintenance intervention criteria

These are based on features that are measured in an objective and repeatable manner. Further, as the intervention criteria apply across the entire network, they must be affordable from a network funding level perspective. Setting of affordable intervention criteria for a 30 years' time horizon for a network can be difficult given future funding uncertainties. Therefore, different funding scenarios with different sets of intervention criteria have been developed.

Routine maintenance

intervention criteria are more specific than the approach taken in developing infrastructure preservation programmes. Setting routine maintenance intervention criteria involves establishing, for different classes of asset (roads, structures, roadsides, traffic signals and on-road electrical assets), the maximum acceptable routine maintenance inspection periods, severity and extent (intervention levels) of condition parameters that can be tolerated and times within which condition parameters are to be repaired (response times).

Intervention levels are specified in Council's Road Maintenance Contract and define the value (extent and severity) of a condition parameter, which triggers either maintenance investigation or maintenance activity. An intervention level will identify a defect as either acceptable or unacceptable. The latter will require further consideration of the defect in relation to its location with respect to the asset, safety issues, the possibility of continuing deterioration and increased repair cost and the economics of not undertaking repairs.

Response times are specified in the Road Maintenance Contract stating the maximum period between the time the defect/condition parameter was detected and the maintenance action was undertaken. Response times are based on the severity and extent of the defect/condition parameter and the level of asset usage.

Periodic maintenance and rehabilitation

Intervention levels are established for combinations of condition parameters to trigger investigation into major infrastructure preservation activities. For example, intervention levels are set for road surface roughness to trigger investigation into pavement rehabilitation. The optimum intervention level for road roughness is determined using a whole of life cycle costing analysis which includes ONRC Performance Measures (Amenity).

On the other hand, pavement resealing operations are usually triggered using a number of criteria/condition parameters, which may include, seal age, extent of surface distress (cracking and patching), rutting and roughness.

4.1.16 Approaches to setting maintenance intervention criteria

4.1.16.1 Risk assessment

Maintenance intervention criteria and asset performance targets, particularly those related to reactive maintenance activities, are established using a risk management approach to best meet reasonable community expectations within the available budget. Maintenance intervention levels and response times vary across the road network in line with relevant risk factors such as the nature and volume of traffic using the road, operating speed, the susceptibility of assets to deterioration, the cost effectiveness of repairs and the competing priorities for funding.

Risk assessment combined with engineering judgement and community input is the most common process used by Council in establishing intervention criteria for most condition parameters of road assets. The NZTA Z/44 risk management methodology is used to determine the likelihood of an incident or failure and its consequences in order to establish the overall risk assessment. The risks considered are related to user safety, asset integrity, damage to other assets, utilisation of assets and environmental risks.

4.1.16.2 Economic analysis

Council invests in a wide range of activities that help to achieve land transport outcomes and deliver value for money. Council does this by using the resources made available through the Financial Assistance Rate provided from the National Land Transport Fund (NLTF) and the revenue it gathers through rates.

NZTA's Monetised and Non-monetised Benefit and Cost Manuals provide procedures to evaluate the economic efficiency of Council's investment proposals in line with the Agency's Assessment Framework. These procedures sit within the investment policy framework set out in the Agency's Knowledge Base.

The Monetised and Non-monetised Benefit and Cost Manuals employ a whole of life cycle costing economic analysis procedure to compare competing investment options over a given time period to identify the option that results in the minimum total life cycle cost. Since Council aims at minimising the cost of maintaining its assets over their whole life cycle, it uses these manuals, where possible, to set the optimum intervention criteria that achieves the minimum total life cycle cost. The Monetised and Non-monetised Benefit and Cost Manuals consider benefits and costs expressed in quantitative money values.

The analysis to set intervention criteria is limited to preservation and rehabilitation works of road pavements. This limitation is due to a lack of reliable life cycle deterioration and works effects prediction models for the other assets. In practice, however, the final selection is based on available funds, equity considerations, community expectations in terms of CLoS and engineering judgement regarding the reliability and accuracy of the prediction models for road deterioration and works effects.

4.1.17 Road asset condition monitoring

Asset inventory and current condition data is a central aspect of road asset management. Inventory data such as reference number to road segments, road name, road category, road length, lane width and other dimensions, road location, road traffic (lane or overall), pavement age, seal age, shoulder and table drainage, are important for locating the asset and are used for predicting the asset performance over time and determining the cost of closing performance gaps.

The condition of the asset is described by a set of attributes. The quality of these attributes changes over the lifetime of the asset. Sound decisions about interventions and investments rely to a large degree on knowledge of the current condition and the rate of change in the condition of the asset.

Condition monitoring is the continuous periodic quantitative assessments of the actual physical condition measurements of all asset classes (e.g., pavement roughness, bridge strength, signage reflectivity). The set of condition parameters to be measured and assessed describe the long term performance of each type of asset. The performance of a road asset is assessed in terms of its function (safety, serviceability, physical appearance, quality of service) and structural condition (load-carrying capacity, structural integrity, durability). Pavement roughness, for example, is a functional performance measure and an indicator of structural condition while skid resistance is a measure of the safety function.

Interpreting Performance Measures results requires a good understanding of the asset's failure modes, the timing, consequences and associated risks of the failure and an understanding of how the condition of the asset affects the quality of services it is intended to provide and the perceptions of the users. The parameters selected must be able to be assessed or measured in an objective, accurate, verifiable and affordable manner used selectively for modelling to forecast deterioration and estimate future condition.

Condition monitoring processes provide relevant information at an affordable price. They include a number of methods including measurement of specific parameters (e.g., rut depth) or visual examination by qualified staff (resulting in a condition rating on a predetermined scale).

4.1.18 Network segmentation and data aggregation

Network segmentation and data aggregation are used to characterise the road network for the various possible forms of WoLCC analysis. The input data is representative of the network and appropriate to the level of analysis being undertaken. The analysis varies from a strategic level to the development of project level recommendations on individual road segments.

The two key interrelated steps are road network segmentation and data aggregation:

Road network segmentation subdivides the road network into manageable and homogeneous lengths.

Data aggregation is the aggregation of the road inventory and condition information into the defined segments in order to adequately reflect the characteristics of the road segment.

The above two processes are inter-dependent. Further data aggregation is then conducted by transforming the road inventory and condition data into uniform segments that were defined during segmentation.

The segmentation of road networks can be rigorous and repeatable, based on either engineering judgement, or the use of a fixed pre-determined length. Segmentation of pavement lengths is based on homogeneity where at least some of the relevant condition and use parameters are relatively constant and statistically representative values of the relevant condition and use parameters. A combination of the two approaches is used as a practical means to gain representative segments.

4.1.19 Performance gap analysis

An analysis was carried out to reveal performance deficiencies or gaps in the network where the asset is below the ONRC-CLoS and Performance Measures.

The gap analysis was done to develop the 2018-21 Long Term Plan and a 30-year rolling programme for road network maintenance management. This facilitates the preparation of long term budgets and the planning of resources and maintenance activities. These long term programmes are reviewed annually giving consideration to projects deferred from the first year's programme, the backlog of needs and the availability of resources.

The gap analysis was performed considering asset ONRC-CLoS and Performance Measures in terms of configuration, condition and operational performance. Separate funds were allocated to the different programmes including investment, rehabilitation and periodic maintenance. The activities under these programmes are co- ordinated to ensure efficient utilisation of Council resources and funds.

The gap analysis established the required investment plan by projecting the road asset parameters to determine the required ONRC-CLoS and Performance Measures to estimate future needs. The processes of gap analysis and investment planning and evaluation is not carried out in isolation, they interact and the output from one process is used as input into the other.

4.1.20 General aspects of investment planning and evaluation

Investment planning and evaluation identifies where and when to invest resources in the most cost-effective manner on the road network for the road users. This is undertaken in the context of the following:

- The Strategic Assessment which covers initiatives such as, sustainability, a growing economy, etc
- The Strategic Priorities that define what needs to be done
- Key Results Areas (KRAs) statements that quantify progress in meeting Strategic Priorities.

- Performance Measures are identified in response to the goals and objectives and indicate the condition state of the network and form a reference for future network condition states
- Technical tools and data allow objective evaluation and optimisation to select the appropriate strategy from various alternatives to maintenance and/or improve road network performance
- Monitoring and feedback is needed to assess the impact of past and present investments on the road network.

The last activity above is an essential input to the performance gap analysis.

4.1.21 Formulation of total needs programme

This step identifies intervention options to close the asset performance gaps. These intervention options comprise the total needs programme. It is expected that owing to resource constraints, only a portion of the total needs programme will receive funding. To ensure an equitable allocation of resources and to achieve Council's objectives, the total needs programme is prioritised.

The formulation of the total needs programme involved the following process for each asset performance gap.

4.1.21.1 Investment planning

Investigating intervention options including engineering and management solutions such as road use policy initiatives, preventive or periodic maintenance, rehabilitation, reconstruction, construction, education, incentives, or penalties. During this process maintenance works are integrated with capital upgrades to ensure efficient and sufficient investment of funds.

4.1.21.2 Investment evaluation

Defining and broadly costing phases of potential projects and identifying the optimal intervention option to close the gap. Evaluation is applied to all programmes including the routine maintenance programme. Coordination of these programmes takes into consideration that if rehabilitation, reconstruction or replacement is due then routine maintenance for the same segment could be excluded. The total needs programme is the final list of projects created from the above process.

Budget scenarios define for the activity management model the amount of money that can be spent in any particular year of the analysis. The model uses the allocated money to optimise the network. That is, a single strategy is selected for each of the analysis sections based on the overall benefit to the network as a whole and on the available funds. The result of prioritisation and/or optimisation and funding scenarios lead to the identification of the works programme.

4.1.22 Maintenance treatments and strategies

4.1.22.1 Maintenance treatments

These are actions Council takes on a given asset to either reduce the deterioration rate or to repair the effects of deterioration. A set of generic maintenance treatments are used for network level analysis to determine the optimum options for each performance gap and the required budget for keeping the network at the defined ONRC CLoS and meet the Performance Measures. These treatments are selected and programmed based on common intervention practice by Council.

Depending on the purpose of treatment selection, the approach to carrying it out varies. The two main approaches considered are as follows:

- Network level approach: Used for planning and priority programming, including selecting network investment strategies and screening to identify major defective sections of the network
- Project level approach: Used for treatment selection and/or design and evaluation of maintenance effectiveness.

Within the above two approaches, two different types of treatment selection processes are used:

- Scheduled: That is, a fixed amount of a given maintenance type per year or a given maintenance type at fixed intervals of time
- Condition-responsive: That is, maintenance intervention when the asset condition is predicted to reach a specified intervention level

Scheduled maintenance tends to be undertaken for the more unpredictable works such as environmental maintenance, e.g., drain clearing, or where the cycle of deterioration is relatively rapid (vegetation growth, unsealed road grading, etc.). Condition-responsive methods are used in most other situations.

4.1.22.2 Maintenance strategies

Maintenance strategy or treatment intervention strategy is where a major treatment occurs in a particular year, during the life cycle of the asset, possibly combined with a secondary treatment in a later year which can also be combined with ongoing preventive maintenance and reactive maintenance treatments. Each strategy has an associated present value cost and a present value benefit. The benefit is measured by the impact of each of the treatments contained in the strategy on the performance.

The application of the treatment or treatments are specified by time or condition level (intervention level or criteria). A set of maintenance strategies (treatment types and timing) for each asset, for use at network level analysis, has been developed for different ONRC category and associated CLoS together with relevant treatment intervention criteria.

A whole of life cycle cost analysis is used to determine the strategies that achieve minimisation of total life cycle costs at network level. The selection of the optimum maintenance strategy for each ONRC category and associated CLoS is based on economic criteria and/or multi-criteria.

Determining the optimum set of maintenance strategies requires performing a number of analyses using Council and NZTA business rules for maintenance management. This process involves reviewing historical records on expenditure, maintenance practice and effects of past and current strategies on budget and asset performance.

For each gap, the optimum maintenance strategy applicable to the ONRC category and associated CLoS is applied and related costs are determined. The intervention options are then listed and ranked considering using economic criterion. The maintenance interventions defined by Council and NZTA are used to select appropriate treatments to meet Performance Measures.

4.1.23 Approaches to prioritisation

The road network components of most interest, and of high priority, are:

- those that are the most expensive (in terms of life cycle costs)
- those that are key contributors to performance (to satisfy stakeholder needs)
- those that are the most prone to deterioration or need ongoing maintenance investment

The components of the highest priority include road formations (cuttings, embankments and the sub-grade), drainage, pavements (the road surfacing and structural layers that support the traffic loading), safety and bridges.

Council's approach to prioritisation is based on asset preservation. The process utilises the Pavement Condition Index (PCI), a numerical index between 0 and 100 which indicates the general condition of a pavement. PCI is a function of strength, roughness, rutting and the consequences of routine maintenance application.

New capital works are often initially prioritised in terms of Benefit Cost Ratio (BCR) but a final decision on which projects will be funded follows the Business Case Approach.

4.1.24 Optimisation techniques

The optimisation employs optimum intervention standards, which take into account whole of life cycle costs. The intervention standards identify projects which are inspected and listed in the expenditure scheduling system for the total needs programme "the long list". The funds for these projects are then allocated on priority.

The approach for prioritising projects is transparent and objective. Not all externalities and possibilities are taken into account in this model, but it does serve as a guide to project suitability and provides an objective indication of the benefits gained or forgone by including alternate programmes. To achieve the true benefits of Integrated activity management both capital and maintenance works are considered together in a transparent process.

Council takes a top-down approach to optimisation. The top-down approach first determines the desired goals (ONRC CLoS, intervention levels, capacity, etc.) for the entire network then selects the individual projects based on those goals. The top-down approach is considered to be the most expeditious because the individual projects are determined after the network goals are set.

4.1.25 Funding policy

The ultimate limiting factor governing decisions on which projects can be included in Council's Long Term Plan, the RLTP and the National Roading Programme is the level of available funding. Setting this level of funding is a complex matter requiring numerous iterations of the process. When seeking NZTA subsidies Council has to ensure that it can meet the local share before submission.

Council's Financial Strategy guides decision-making from the outset and provides guidance for resolving the complex issues that need to be addressed during preparation of the roading infrastructure programme.

4.1.26 Backlog of needs

The change in the backlog of needs presents the impact of funding decisions. Backlogged needs are defined as the management sections or items to which maintenance and rehabilitation should have been applied, but which were not funded. This is presented by the amount or percent of asset area or number of items backlogged. This amount is calculated by subtracting the quantity of assets selected for funding in the optimisation process from the quantity of assets identified as needing work in the needs analysis.

4.1.27 Deferred funding needs

Deferred funding shows the amount of money that was needed for maintenance and rehabilitation but was not available, resulting in the funding being deferred until some later time. The deferred amount is calculated by subtracting the funds allocated in the optimisation process from the amount of funds estimated to undertake the work identified in the needs analysis process.

4.1.28 Stop-gap maintenance

The amount of stop-gap maintenance is another measure that can be used to demonstrate the impact of different funding scenarios. Stop-gap maintenance is used to describe maintenance and some rehabilitation treatments that are applied to keep a pavement section in serviceable condition until the funding required to correct the underlying problem is available.

These treatments are applied to backlogged pavement sections that are in such a poor condition that they cannot tolerate any further funding deferral and need some money spent on them to keep them serviceable. These sections can be described either in terms of the amount or percent of asset area to which stop-gap maintenance is applied or in terms of the additional funds needed.

4.2 Operations and maintenance plan

4.2.1 Introduction

Council ensures that all items of programme development and implementation align with the strategic direction by:

- setting maintenance intervention criteria for the different road assets depending on their classification
- using the relevant Customer Level of Service (CLoS) Performance Measures
- aligning the programme with the strategic direction and CLoS Outcomes
- optimising the intervention options when developing the total needs programme
- prioritising candidate projects when developing the works programme
- selecting the types of treatments, materials and construction techniques when implementing the programme
- ensuring that the Activity Management Plan (AMP) follows the strategic direction

The activity management process is intended to deliver agreed levels of service in the most cost effective meaner to present and future customers. Managing the transportation network infrastructure is simply one of the inputs to this process.

At the highest level, the services to be delivered and standards to be achieved are those that contribute towards the achievement of the community outcomes in Council's Long Term Plan.

Gaps between required standards and services and the ability of the network to deliver them are identified and processes are put in place to manage these gaps within acceptable margins. In managing these gaps, both asset solutions (such as new or enlarged asset elements) and non-asset solutions (such as use reduction programmes) are considered. Decisions on the option to be followed in any particular instance are based on a range of factors such as risk assessments, legal requirements, through life costs, customer approval ratings and the ability of the community to pay for system improvements.

The detailed considerations behind these decisions are not made or detailed in this AMP; rather, they occur during the early stages of the projects' development as determined by the complexity, scale and potential effects of the problem / issues and the options available to address them.

4.2.2 Operational objectives and intervention levels

In order to fulfil Community Outcomes, Vision, Goals and Objectives, Council have adopted a systematic approach to the long term management of its assets by preparing this Activity Management Plan.

The key objective of AMP is to provide a desired level of service in the most cost effective manner while demonstrating responsible stewardship for present and future customers. Activity Management Plans are a key component of the strategic planning and management of Council, with links to the LTP and service contracts.

The AMP underpins the Long Term Plan (LTP) and consultative processes that have been put in place to engage the community. The AMP delivers a range of benefits to the community as well as to the provider of the services, the main ones being:

- Maintain, replace and develop assets over the long term to meet required delivery standards and foreseeable future needs at minimal cost
- Continually improve activity management practices and service delivery to the customers
- Comply with Statutory Requirements

4.2.3 Developing maintenance plans and procedures | Activity management systems

The primary activity management system in use is RAMM (Road Assessment and Maintenance Management), which is the main repository for all of the Councils roading asset inventory and condition rating information. RAMM software has been developed over a number of years and is used by most RCA's in New Zealand to manage their roading assets.

This system, combined with integrated predicted deterioration modelling functions and asset valuation modules, provides the asset information to produce this plan, and operate and manage the network. The software is developed and supported by RAMM Software Ltd, Auckland.

4.2.4 Monitoring, supervision and quality assurance

Council actively monitors the performance of the contractors, internal professional services unit and consultants to ensure that the performance standards defined in contracts are continually achieved. Contract C/4-1005 Road network Maintenance includes specific network surveillance and condition monitoring as part of the overall network monitoring programme.

4.2.4.1 Monitoring schedule of primary assets

Asset Category		*Monitoring*
Roads	Road Pavements	Inspections by road maintenance contractor ranging from weekly to monthly based on road type Daily monitoring by Council Roading staff RAMM Rating: All sealed roads carrying >500 vpd rated annually as per RAMM processes 50% of the remaining sealed local road network rated annually so that all are rated once every two years Roughness, skid resistance, surface texture, pavement rutting surveys on major routes and other roads carrying > 500 vpd are conducted on a 2-yearly basis (Unsealed roads are currently not rated)
	Footpaths	Annual inspection of 100% of network by roading staff and contractor RAMM Condition rating of 100% of Network at 3-year intervals
Drainage	Culverts (<3.4m^2)	Annual visual inspection by road maintenance contractor
	Kerb and Channel	Annual inspection of 100% of network by roading staff and contractor RAMM Condition rating of 100% of Network at 3-year intervals
	Sumps	As part of cyclic cleaning programmes
Structures	Bridges, Large Culverts (>3.4m^2) Retaining Structures	Routine visual inspection included in network inspection by road maintenance contractor and Council roading staff Visual inspection every 12 months, and during and following natural events Detailed structural inspection on a 6-yearly rolling cycle
Safety Facilities	Road Markings Edge Marker Pegs Raised Reflective Markers	Routine visual inspection included in network inspection by road maintenance contractor and Council roading staff. Road Markings are repainted annually
	Signs Guardrails Sight-rails	Routine visual inspection included in network inspection by road maintenance contractor and Council roading staff
	Streetlights	Regular night-time inspection and annual daytime inspection by street light maintenance contractor and council staff

4.2.4.2 Supervision

Regular auditing of contractors and consultants performance is undertaken to ensure performance measures are being met (as detailed earlier in this section of the plan). The Council roading team audits contractors performance by measurement and inspection of work, and of the roading assets.

The Council's roading team has engineers who are dedicated to the operations and performance of the road network maintenance contract. They provide an important conduit between the contractor and the Engineer to Contract in the identification and resolution of any problems or issues as they occur.

The Council's roading team have daily contact with the contractors to:

- Keep informed of where the work is being done
- Inspect work on a daily basis resolving any issues on site
- Report to the Engineer on the work being done
- Approve work to the Contractor
- Clarify contract issues
- Have a crucial role in developing and maintaining the partnering approach and relationships essential to the successful management of long term contracts, e.g., the road maintenance contract

4.2.4.3 Quality assurance

All main contractors, stipulated as part of any contract, are required to submit for approval a Quality Assurance Plan(s) prior to the commencement of the contract that establishes standard and specific quality procedures relevant to the work being conducted. This is particularly relevant for the main on- going road maintenance, road marking and street lighting contracts. For term period contracts, the Quality Assurance Plan(s) are reviewed updated each year of the term of the contract.

4.2.5 Operational process plans

4.2.5.1 Categories of road maintenance programmes

The main objective for Council is to maintain its assets at appropriate CLoS and structural integrity at the lowest possible cost (Council and user costs) without creating any significant adverse impacts on the environment, user safety and community activities.

The programme development process involves identifying infrastructure needs, determining the maintenance works programme and funding needs to ensure adequate performance of existing assets. Council's maintenance programmes fall under four categories namely, (1) Emergency and Resilience Improvements, (2) Maintenance [Routine], (3) Maintenance [Renewals], and (4) Minor Improvements. The activities carried out under these programmes are defined below.

4.2.5.2 Emergency and resilience

The response to a defined, major, short-duration natural event that has reduced or will reduce customer levels of transport service significantly below those that existed prior to the event and results in unforeseen, significant expenditure. Resilience improvements are non-routine work required to protect the serviceability from damage, and to minimise the threat of road closure arising from natural phenomena.

4.2.5.3 Maintenance | routine

Comprises those activities for which deferment is not an option, with public safety identified as the highest priority. These activities include Sealed pavement maintenance, Unsealed pavement maintenance, Routine drainage maintenance, Structures maintenance, Environmental maintenance, Traffic services maintenance, Cycle path maintenance, Level crossing warning devices, and Network and asset management.

4.2.5.4 Maintenance | renewals

Comprises those activities which are required to improve/preserve asset functional integrity to meet road infrastructure performance targets and reduce future deterioration. These activities are designed to reduce future deterioration by timely surface interventions that limit the need for expensive rehabilitation while also ensuring that general safety levels are maintained. They include Unsealed road metalling, Sealed road resurfacing, Drainage renewals, Sealed road pavement rehabilitation, Structures component replacements, and Traffic services renewals.

4.2.5.5 Minor improvements

Provide 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. Routine maintenance activities do not form part of the works programme as they are mostly reactive in nature and triggered by defect development, incidents or user complaints and require short response times. Further, their allocated budget is based on expenditure in previous years and/or contractual lump sum amounts with the budget remaining relatively stable over the years.

Developing annual and medium (three to five years) term works programmes for asset maintenance and renewals is based on current and predicted asset needs and/or performance gaps as measured by Performance Measures Reporting Tools.

4.2.5.6 Outline of programme development process

Separate funds are allocated to the different programmes including investment, rehabilitation and periodic maintenance. To ensure efficient utilisation of Council's resources and funds, the activities under these programmes are co-ordinated. The reasons for separating out maintenance are as follows:

- A large proportion of road maintenance work is of a routine and fixed nature and is not subjected to assessment and appraisal
- Periodic maintenance, e.g., resealing, is usually a case of timing and treatment selection with the aim of minimising the whole of life cycle costs, including road user costs, for the whole road network
- Major rehabilitation projects are appraised to identify the rehabilitation needs using a whole of life cycle cost minimisation. For each identified maintenance project, Net Present Value (NPV) calculations are carried out to rank the selection and timing of rehabilitation treatments
- Growth projects are appraised and developed using the Business Case Approach

To ensure an equitable allocation of resources and to achieve Council's desired outcomes, prioritisation and optimisation techniques are used to identify the optimum combination of projects that could be achieved under different funding scenarios. As well as aiming at minimising life cycle costs, the process of optimising and prioritising includes consideration of strategic network requirements and strategic corridor improvements.

The result of prioritisation and/or optimisation leads to the identification of the works programme. The final works programme includes the funding required for the different maintenance programmes, together with details of the specific works.

The three year rolling programme for road network maintenance management facilitates the preparation of medium term budgets and the planning of resources and maintenance activities. The three year programme is reviewed annually giving consideration to deferred projects from the first year's programme, the backlog of needs and the availability of resources.

4.2.5.7 Network/system level management

Network/system level management decisions affect the maintenance programmes for the entire system. The management system considers the needs of the network as a whole and provides information for a District- wide programme of new construction, maintenance, and rehabilitation. The goal of this level is to optimise the use of funds over the entire system.

4.2.5.8 Project level management

Project level management is where specific maintenance treatment/approach alternatives are examined on a technical and economic basis in order to make decisions about which specific maintenance treatment/approach will be used for each project. At this level, detailed consideration is given to the alternative design, construction, maintenance and rehabilitation activities for specific maintenance projects.

For maintenance and rehabilitation this is accomplished by comparing the NPVs of several alternatives with their associated life cycle activities and selecting the alternative that provides the highest net benefits for the least net total cost over the projected life of the project.

For minor improvements (under $2,000,000), the primary most cost effective sites are identified and ranked in order of importance against the rest of the network. The development of capital projects will follow the business case approach.

4.2.5.9 Linkage between programme development and annual planning cycle

The strategic planning process is conducted on a cyclic basis, linked to Council's planning and funding cycles. The linkage occurs as follows:

The annual planning process commences with an asset performance gap analysis. During this stage, the set of committed projects is restated, while infrastructure needs are identified. These investment needs result in the total needs programme. All necessary overhead costs are included as part of the investment.

Optimisation and/or prioritisation of investment options results in the identification of revenue requirements. Such requirements are presented to the funding providers (Council and NZTA) and a process of negotiation takes place. Depending on the outcome of the negotiations and various funding scenarios, investment options and prioritisation may be reviewed.

When Council is satisfied with the revenue requirements for the funding scenarios, the requirements become the works programme that is submitted to NZTA. Following budget submission, the next annual cycle commences. The actual funding allocation process typically spreads over a few months.

4.2.5.10 Programme development

The decision-making process for road activity management is a combination of bottom-up and top-down approaches. It is bottom-up in the sense that needs are generated from the component level, and it is top-down in the sense that budgets are dictated by NZTA's requirements and Council as part of the political process.

Council has adopted a combination of these approaches in developing the maintenance works programme. The programme is developed at the district level by Council staff based on guidelines prepared by the NZTA. NZTA considers the Council's submissions and makes funding allocations, as appropriate, under each work category to the district. On receipt of allocations, Council reviews priorities and determines the works that should proceed determined through economic and business case analysis.

4.2.6 Accounting/financial systems

All expenditure on infrastructure assets falls into one of three categories:

- Operations and maintenance
- Renewals
- New improvement works and disposals

4.2.6.1 Financial management system

All Council activities are required to have their financial results reported externally in a way that complies with generally accepted accounting practice (GAAP) in New Zealand. The Finance Team ensures that GAAP is complied with by regular updates to the Council's Accounting processes, and the on-going formal and informal training and education of staff in departments throughout the Council.

The activity relies on the Council's core financial systems which include Ozone accounts payable, time entry, purchase orders, general ledger, accounts receivable, cash receipting, bank management and rates, plus inputs from other Local Government regulatory systems such as Person/Property, Infringements, Licensing, and Consents.

4.2.7 Requests for service (public enquires and concerns)

To assist reactive maintenance, Council deploys a Customer Service via Origen. Contact Centre Transactions (CCT) requests for service are received through Council's Contact Centre during business hours and the Palmerston North City Council after hours service centre. CCTs are presently recorded via the Origen system and forwarded to the appropriate council staff or maintenance contractor for action. The CCTs are recorded with the appropriate details (name, location, issue, priority etc) to enable tracking for resolution etc.

The receiving officer/maintenance contractor is required to action the enquiry within a specified period. Once the issue is resolved to council's requirement the details are updated with completion time/date and any issues etc. The information in this system has been interrogated to produce the information in the Levels of Service section of the AMP.

4.2.7.1 Performance rating | Resident survey

Council undertakes both customer surveys and assessments of the complaints/service request records to obtain information on the delivery of levels of service to customers. This research identifies areas that are performing well, those that require improving or require intervention. Also of significant value to Council is regular meeting minutes with various Community Committees and Boards throughout the District which provide wide ranging information and highlight any particular issue to be addressed. This information compliments the regular management inspections of assets undertaken by Council and their agents.

4.2.7.2 Service requests

Customer contacts and requests are recorded in the corporate Ozone Service Request system. The records information pertaining to a particular item, a facility to request services and provides Council with a monitoring facility for response times to requests from Customers. The tracking of a type of activity can be monitored against contractor performance or whether a significant issue is/or has occurred within the district.

4.2.8 Information management systems

Current Council information systems used in the roading and street services function are outlined below. Other activity management systems are used by other asset managers within Council. Linking & integration of systems is a corporate function.

Information Management Systems

System	Current Business Practice
Asset Registers	RAMM Reliable asset registers available for most assets except berms and markings
Financial System	Ozone Job costing system available, via general ledger system Costs allocated at activity level only Inflation adjustment application Asset valuation generated in RAMM formulated from the database inventory
Maintenance Management	Maintenance records held in RAMM, direct entry by the Maintenance contractor
Contract Management	Maintenance standards specified in maintenance contracts RAMM and manual works order systems for unscheduled or out of contract work
Condition/Performance Monitoring	Good performance and condition information for major asset groups, i.e., pavements, bridges
Customer Enquiries	Customer service system in place
Work Planning	RAMM treatment selection analysis undertaken Bridge repairs identified and programmed Minor asset groups defect analysis less developed
Risk Management	No corporate risk management strategy in place AM plan to include risk register and analysis
Optimised Renewal Strategy	RAMM treatment selection module available for pavements Effective lives assigned to all asset groups
Forward Works Programme	Forward programmes developed for major road improvement projects, seal extensions, seal widening and bridge renewals. Development based on a good assessment of needs confirmed under consultative processes
Integration of Systems	Extensive use of RAMM throughout planning and operations All databases have GIS type interfaces or functionality
Plans and Records	Hard copy plans held for most major project and improvement works. (Availability reduces as further back in time) All new plans/as-builts on digital systems, and on consents information system
GIS	GIS used for spatial representation of assets

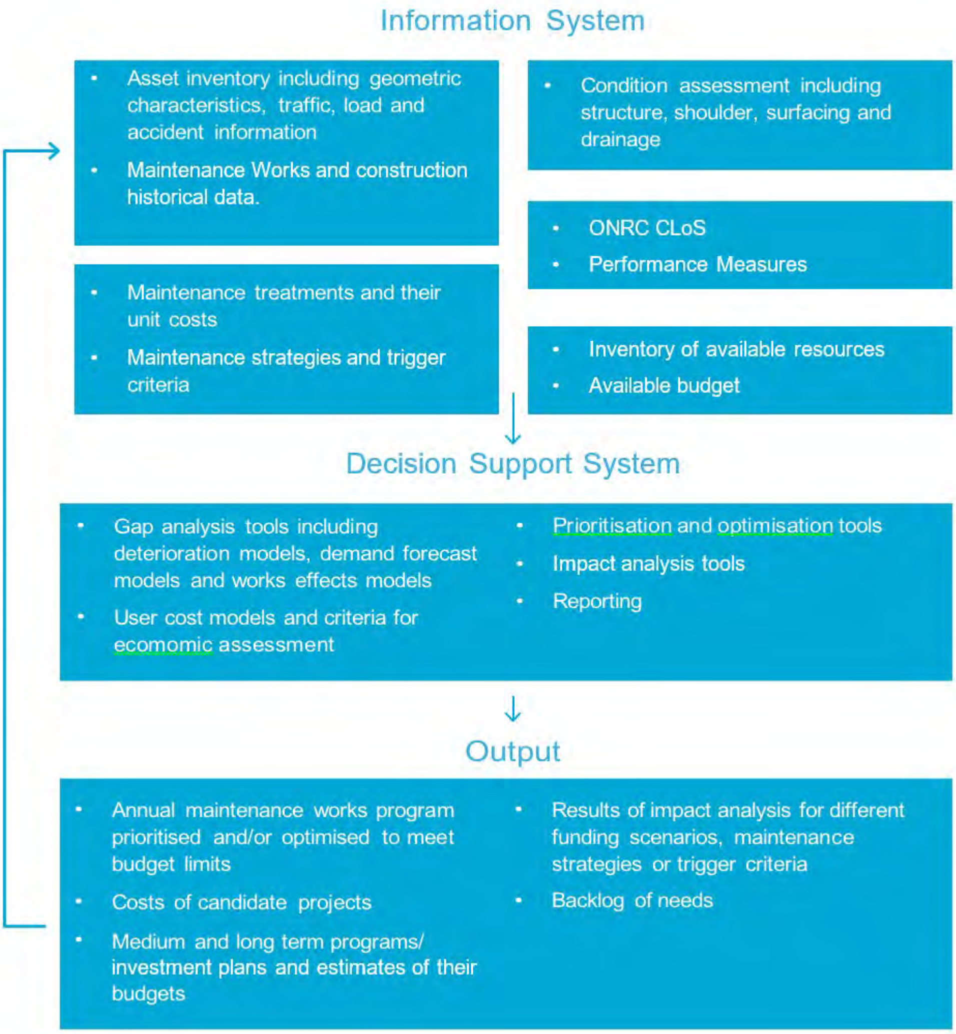
4.2.9 Activity management systems

Maintenance works programmes for road assets are developed using Road Assessment and Maintenance Management (RAMM) software. This software is used by Council to manage Road Inventory Assets and Condition for their Network. RAMM is the complete package for asset maintenance, valuation, assessment, Forward Work Planning as well as inventory-based asset management. It also includes a range of report and analysis applications which complement the management functions.

RAMM is a tool for organising all the activities that go into providing and operating assets, ranging from the collection, processing and analysis of data, the identification of current and future needs and the development of rehabilitation and maintenance programmes to implementation of the programmes.

Road hierarchy classification systems and associated Performance Measures help to improve efficiency of decision making, provide feedback regarding the consequences of decisions and allow the testing and optimisation of different budgets.

RAMM is divided into information management systems and decision support systems that can be viewed as an overarching Activity Management System (AMS). It is not critical that the AMS is fully integrated, provided the different modules/elements are interfaced appropriately. The elements incorporated into the AMS are dependent on Council's needs. Selecting the most appropriate combination of AMS elements for Council involves considering a number of conditions including District size, organisational structure, past management and decision making practices, stability, planning horizons, resources and fixed investments. Council also estimates the quantity of resources it needs when implementing an AMS.



RAMM is used to analyse the high volume of detailed information required for a variety of activity management functions. RAMM has connectivity with other Council information databases so that information can be easily transferred e.g., LocalMaps and Ozone. GIS enables identification and an asset from the office or the field as well as facilitating the scheduling, reporting and coordination of maintenance activities.

4.2.9.1 RAMM software

Is the Council's prime inventory system for its roading assets is the RAMM (Road Assessment and Maintenance Management System) database. The RAMM system is web-based, and the councils data is hosted by RAMM Software Ltd. The system is available simultaneously to users in the Council and to its contractors, consultants and data-maintainers. The RAMM "Mapping Interface" is used but it is not linked to the corporate GIS system.

The database is updated constantly following maintenance and renewal work activities this enables forward work programmes to be developed, for both the short and long term. These programmes provide analysis, prediction and costing of major pavement renewal works such as reseals and sealed road pavement rehabilitations, in addition to other works such as kerb and channel and footpath renewals.

Road network maintenance data is entered directly by the contractor and used for activity management and contract management purposes. The Council also uses the RAMM system to undertake valuation of the asset, using the Asset Valuation Module.

4.2.9.2 RAMM inventory

An extensive range of inventory items can be recorded using RAMM under the following broad headings:

Asset category	*Inventory Items*
Carriageway	Road name/location, Descriptions/dimensions, Summary traffic volumes and loads, Ownership
Treatment lengths	Condition Maintenance activities, Pavement type, Treatment intervention costs
Traffic	Traffic volume, Traffic mix
Carriageway Surfacings	Description/dimensions, Location/age/surfacing
Pavement Structure	Pavement layer, Rehabilitation
Kerbs and Channels	Location Type, Descriptions/dimensions, Ownership
Footpath and Berms	Location Descriptions/dimensions, Surfacings, Ownership
Drainage	Dimensions/type Location/maintenance, Ownership
Traffic Facilities	Location/type, Quantity/maintenance, Ownership
Bridges and Major Culverts	Components Dimensions Restrictions, Ownership
Route Data	Features, Location/type
Street Lighting	Pole location/material/type/dates/ownership, Lamp type, Location/dates/ownership, Bracket type/dates
Asset Valuation	ORC, ODRC, AD Expected life RUL, Effect of condition on life Replacement asset type, how asset element is measured (volume, area etc)
User defined Items	In addition, RAMM can cater for an unlimited number of user defined items

RAMM also has bult-in functionality:

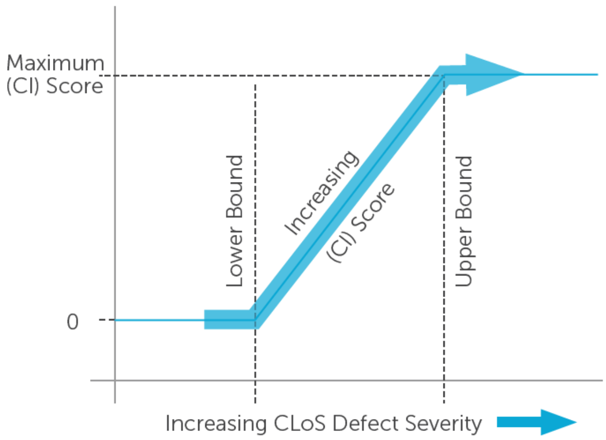
- To record requests for service and track their progress and completion
- To issue works orders
- For pending work to be recorded by location and asset element
- For the contractor to sign-off repairs as they are completed and update the asset data base accordingly
- For collection and updating of data
- For interpretation of problems and issues on-site – though the availability of all data held on the asset element

4.2.9.3 RAMM condition rating

Road condition is measured by recording absolute values for defects rather than condition indices or scores. For example, the number of potholes is recorded in each inspection length. The defects measured are cracks, deformation, surface texture, disintegration, edge defects and surface roughness. Condition of other asset groups is stored in appropriate spreadsheets, i.e., footpaths, kerb and channel etc.

Council uses this data to monitor and project over time the network condition. The projected condition is based on collected data which includes Texture, Roughness, Rutting, and Location Co-ordinates.

A Pavement Condition Index (PCI) Score is applied for each CLoS. This is based on a linear scoring system between lower and upper bounds for each CLoS:



CLoS	*Lower Limit*	*Upper Limit*	*(CI) Score*
Texture depth (mm)	0.7	0.4	0 to 75
Rutting (mm)	10	20	0 to 100
Roughness (NAASRA)	110	160	0 to 80
Maximum Combined (PCI) Score			255

The (PCI) Score is the sum of the individual (CI) Scores at each location. The total (PCI) Score at each location is then classified as follows:

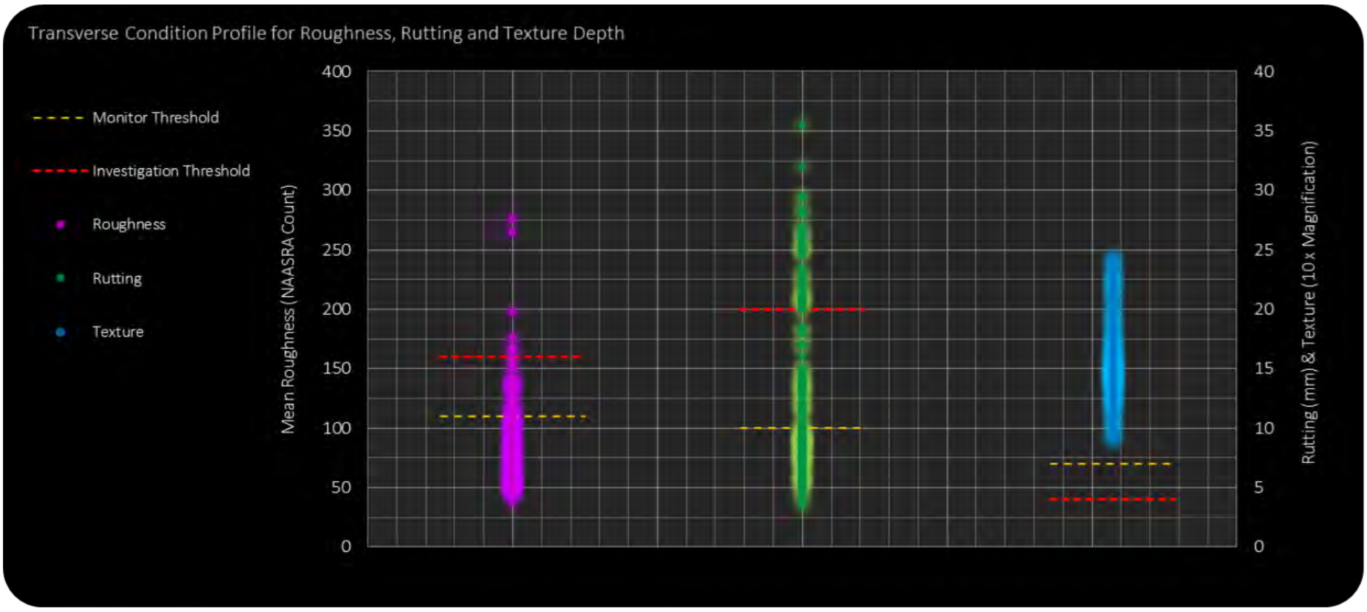
PCI Score	*Condition*	*Classification*
Less than 50	Satisfactory, No Action	GREEN
Between 50 and 75	Minor Deterioration; Observe	AMBER
Greater than 75	Increasing Deterioration; Investigate	RED

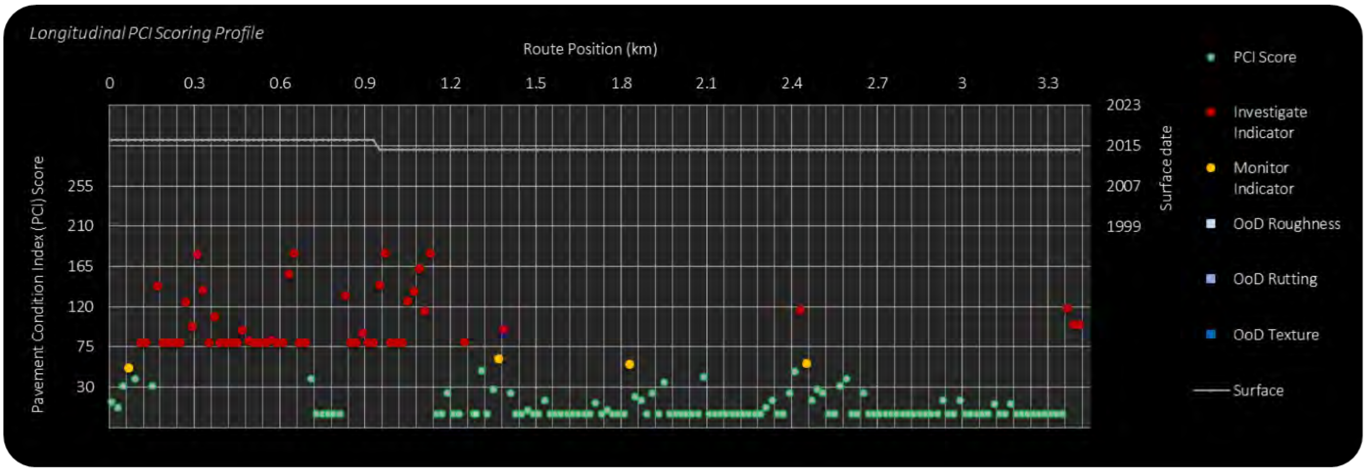
This 'traffic light' grading system can be examined by road length, allowing easy identification of sections that warrant either:

- Observation at the onset of pavement degradation or

- Investigation of more significant pavement issues that will assist with programming and application of effective maintenance solutions

Exemplar of PCI scoring profile below:





	Mean PCI	Counts where 50 > PCI > 75	%'age where 50 > PCI > 75	Counts where PCI > 75	%'age where PCI > 75
Overall Combined	36.68	4	2.3%	51	29.8%
	Mean Element Score	Counts	% Btn Lower & Upper T'hold	Counts	% Exc Upper Threshold
Roughness	10.16	28	16.4%	6	3.5%
Rutting	26.53	41	24.0%	41	24.0%
Texture	0.00	-	0.0%	-	0.0%

4.2.9.4 Treatment selection

The absolute values of defects and distress are used to take into account the faults measured, carriageway roughness, traffic volumes and maintenance cost in determining the overall costs of alternative treatments.

Treatment alternatives vary depending on the type of pavement, as outlined in the following table:

Treatment Alternatives	
Treatments	*Options*
Flexible Thin Sealed Pavements	Continued routine maintenance Resurfacing Smoothing Strengthening
Structural Asphaltic Pavements	Reconstruction Milling and replacing unstable surface mix thin overlay Thin overlay over a stress absorbing membrane layer (SAMI) Stress absorbing membrane reseal (SAM) Conventional reseal Continued general maintenance
Rigid Pavements	Rigid pavements are not currently catered for in the analysis module of RAMM. Rigid pavements are bridge decks. These are inspected and analysed separately by bridge specialists

To qualify for inclusion in this work category, the work must be the long-term least-cost option for Council calculated in terms of present value (PV). Council must undertake benefit and cost appraisals of individual projects and make copies of the evaluations available as requested by NZTA. A simplified procedure is provided for pavement rehabilitation in NZTA's Monetised and Non-monetised Benefit and Cost Manuals.

Treatment options are ranked based on BCR for pavement renewals, and priority indicators (PI) for resurfacing. Priority indicators (PI) are calculated by dividing the additional cost in maintaining a pavement for an additional year by the cost of resurfacing, to give a first year rate of return. The need for renewal of a pavement is checked against the required BCR. If the BCR is not satisfied, it is then checked for a reseal. If a reseal cannot be justified, then the treatment is to continue maintenance.

A preferred pavement renewal option and a preferred non-pavement renewal option is determined and then the two preferred options compared to determine the overall preferred option.

4.2.9.5 Lifecycle cost and pavement performance models

The RAMM system does not include performance prediction modes and life cycle costs are not determined. However, dTIMS provides the ability predict long term pavement deterioration and to optimise treatment selection in conjunction with sound engineering judgement.

Bridges | Inventory

All major inventory information on bridges is held within a separate database developed and maintained by the Council's bridging advisors, WSP (Formerly Opus International) Consultants Ltd. This data includes:

- **General**

  Name, foundations type, superstructure type, and deck type
- **Dimensions**

  Span length, width and waterway area
- **Loadings**

  Design loading, restrictions and posted limits
- **Inspections**

  Date, full inspection data, general assessment (appearance etc.), superstructure condition, piers and abutments and waterway adequacy.

Bridges | Condition assessment

Each bridge is surveyed and inspected at least once every 6 years. All inventory information is captured, and a full inspection performed in accordance with NZTA bridge assessment criteria. This provides the base information necessary to manage repairs and maintenance of the bridges.

The experienced personnel undertaking the bridge inspections assign the repair priorities. Priority levels are set on the basis of:

- Public Safety
- Traffic movement
- Maintaining structural integrity
- Future costs if the work is not done

Subsequent inspections can be added to the database, so a history of inspections is held for future reference. This is particularly important in the assessment of the performance of the asset in terms of particular trends and demands that develop and the corresponding effect on the asset.

The bridge inspection results are also used, by the inspectors, to assess the load-carrying capacity of each bridge. Where the capacity is reduced, by a bridge's condition, to less than normal highway loadings or a restriction on heavy-vehicle speed is required then the Bridge Inspection report includes an appropriate recommendation, in accordance with Section 11 of the Heavy Motor Vehicles Regulations 1974, regarding the imposition of restrictions.

Bridges in very poor condition are scheduled to be inspected at shorter intervals, based on their condition and expected rates of deterioration.

Bridges | Data use

The Council's bridging information is readily downloaded into spreadsheets for further manipulation. Costs can be attributed to the repairs and from this forward maintenance strategies can be determined with likely costs. This is then used to form contract work instructions.

Usually, all the work identified cannot be undertaken in one year due to budgetary constraints. Under the repair prioritisation system, the most urgent repairs are carried out first with less urgent repairs programmed over subsequent years.

4.2.9.6 Geographical information systems

Council uses MapInfo, QGIS and LocalMaps as for its GIS requirements. The GIS systems have some linkages with RAMM system to enable public access to some data. Further RAMM data is made available to all Council Staff via LocalMaps and used extensively through all Councils activities.

4.2.9.7 IT responsibility

The responsibility for asset information security rests with the IT department administrators. The data is backed up at regular intervals and backup files are stored in secure lockups. Each system has a stepped password access system in place, allowing some staff to view the data only, and others to add and edit it. Data manuals are available that explain the various procedures.

4.2.10 Data quality

The assessed current completeness of Council's assets is as follows:

Asset Classification	***Suitable asset classification system adopted for asset***
Asset Identification	Unique ID numbers allocated in RAMM for most assets
Asset Attributes, Spatial Data	Aerial photos available for the district
Plans available for most bridges and recent construction projects	
Asset Attributes, Textual Data	Pavements- >100% complete and ~95% accurate (RAMM)
	Bridges- >100% complete and ~95% accurate (RAMM)
	Footpaths- >100% complete and ~95% accurate (RAMM)
	Streetlights- >100% complete and ~99% accurate (RAMM)
	Kerb and channel- >100% complete and ~95% accurate (RAMM)
	Signs- > 100% complete and ~95% accurate (RAMM)
	Markings- > 95% complete and ~95% accurate (RAMM)
	Minor culverts- 50% complete and 50% accurate (RAMM)
Maintenance Data	Routine maintenance activity and costs available from contracts Unscheduled maintenance work records available in hard copy form
Historical Condition and Performance Data	Good historical records for pavements and bridges only
Future Prediction Data	Good knowledge of future demographic and traffic trends
Life Cycle Costs	Renewal and new improvement costs for common items known from recent experience

4.2.10.1 Contract management systems

Maintenance Contracts are predominately managed using RAMM, however, some small value contracts are managed externally from RAMM (e.g., Road Marking). Management responsibility is assigned to specific staff members who are responsible for contract supervision and contract payments within their delegated authority.

Contracts contain detailed specifications, and those in period contracts continually evolve, being adjusted to reflect changes in best appropriate practice, need and other circumstances.

Although the Council does not have any formal contract management systems, it follows industry best practice in this area.

RAMM houses all the data required to develop maintenance, rehabilitation and improvement programmes. The asset information system stores and updates data for effective use. The data management processes support the decision support system, and a common reference system enables data integration.

The Information System includes the following components:

- Asset reference system, which allows the identification and location of individual components of the road network
- Asset register, which lists the information relating to various aspects of the assets such as inventory, condition, traffic and other road use data, historical records of construction and historical records of routine maintenance, periodic maintenance and rehabilitation, etc

Other information required within the system includes:

- Key operational and performance data
- Maintenance data (available treatments and costs and benefits)
- Unit costs (maintenance and rehabilitation)
- Inventory of available resources
- Performance records
- Corridor Classification/Category and associated CLoS / Performance
- Technical standards including the asset configuration
- Asset valuation

4.2.10.2 Planning for emergencies, crises and incidents | Climate change

New Zealand's climate varies significantly from year to year and from decade to decade. Human-induced long term trends will be superimposed on these natural variations, and it is this combination that will provide the future climate extremes to which New Zealand society will be exposed.

The Ministry for the Environment has produced a document entitled "Climate Change and Long Term Planning" which advises that, "Projections of New Zealand's future climate indicate:

- Temperatures increase on average by 1ºC by 2040 and 2ºC by 2090
- Rainfall has a pattern of increases in the west (up to 5% by 2040 and 10% by 2090) and decreases in the east and north (exceeding 5% in places by 2090). There is marked seasonality in the rainfall distribution pattern changes
- Sea levels will rise
- Decreased frosts
- Increased frequency of high temperatures
- Increased frequency of extreme daily rainfalls
- Higher snow lines and possible reduced snow coverage
- Possible increase in strong winds
- Wetter in the west and south, drier in the north and east
- Increase in frequency and severity of extreme events (e.g., heavy rainfall, storm surges, drought and very high temperatures)

The document also states 'Key principles for responding to climate change'; local government is required to operate under a range of principles that are set out in law or have evolved through good practice and case law. The principles should also be kept in mind when adapting to the effects of climate change. The key principles are:

- Sustainability
- Consideration of the foreseeable needs of future generations
- Avoidance, remedy or mitigation of adverse effects
- Adoption of a precautionary approach
- The ethic of stewardship/Kaitiakitanga
- Consultation and participation
- Financial responsibility
- Liability
- Resilient communities
- Spill

The following mitigation measures may be considered when taking into account climate change:

- Have regard to projections during planning phases
- Cognisance of areas located as being potential hazard zones
- Specialist advice

Natural hazard management

The Manawatū District and surrounding regions are exposed to a number of natural hazards. From an activity point of view hazards have the potential to cause major disruption and need to be taken into account.

Information on the risk posed by natural hazards is sparse for the Manawatū District. In conjunction with the Horizon Regional Council the Council has developed a database of natural hazards.

Horizon Regional Council's One Plan sets outs responsibilities for natural hazard management relevant to the Manawatū District. The plan to minimise risks of natural hazards through:

Raising public awareness of the risks of natural hazards through education, including information about what natural hazards exist in the Region, what people can do to minimise their own level of risk, and what help is available

Making territorial authorities responsible for developing objectives, policies, and methods (including rules) for the control of the use of land to avoid or mitigate natural hazards in all areas and for all activities except land-use activities in the coastal marine area, erosion protection works that cross or adjoin mean high water spring and land-use activities in the beds of rivers and lakes for the purpose of avoiding or mitigating natural hazards

Identifying flood ways and other areas known to be inundated by a 0.5% annual exceedance probability flood event in District Plans and controlling land-use activities in these areas.

Lifeline risks

Engineering lifelines are infrastructure that support life and business in our community. Lifelines Projects aim to minimize the impact of natural hazards on infrastructure networks and reduce the time that networks may be out of services.

Lifeline Risks considered here are:

- Earthquake
- Meteorological Events
- Mass Movement
- Coastal Hazards
- Climate Change

The term 'natural hazards' covers situations where water, air and ground movement have the potential to adversely affect human life and property. They can also have adverse effects upon structural assets and the natural values of areas. The hazards most relevant to the Manawatū District are flooding, earthquakes, land slippage, coastal erosion/deposition and tsunamis (tidal waves). Events such as storms, tornadoes, and volcanic ash showers may also happen, but land use planning could do little to reduce their effects. The potential threats to the Manawatū District are outlined more fully in the Council's Civil Defence Plan.

The first way of reducing adverse effects on people, property and natural values from hazard events is to reduce the severity of the event itself, for example by planting stream catchments to reduce the speed of water runoff. The second is to avoid damage by keeping residents and development away from the hazard. The third method is to try and modify the effects of the hazard, e.g., by constructing stop banks to confine floodwaters.

When it comes to hazard avoidance, the level of risk determines the amount of development which is "acceptable". For example, most people would agree that houses should not be built in places which flood every year, but the risk may be acceptable on a property which is flooded every two hundred years.

Natural hazards in the Manawatū district

The hazards most relevant to the Manawatū District are flooding, earthquakes, land slippage, coastal erosion/deposition and tsunamis. These may result in natural hazards occurring at 2 levels:

- District wide | Large-scale natural hazards which affect all or large parts of the district, e.g., a major earthquake
- Localised | Natural hazards which affect a smaller area of the district, e.g., flooding in a township or a landslip

Flooding is a commonly occurring major natural hazard that results when the natural and modified drainage systems fail in a particular rainfall event. The risk of flooding is influenced by a number of factors such as:

- Weather systems
- Hydrological factors (catchment size, rainfall intensity and infiltration)
- Hydraulic factors
- Soil type
- Land use
- Ground saturation

Storm events and the resulting flooding can result in significant adverse effects on both residents and the environment. These effects may include:

- Personal injury or loss of life, property and possessions or livelihood
- Disruption of utilities and transportation networks
- Impacts on the environment (vegetation/habitat loss, erosion/sedimentation in waterways, soil/water contamination)

Flooding hazards within the Manawatū District have principally occurred within the Feilding and Southern areas of the district. Horizon Regional Council is also modelling the flood risks for Feilding.

Flood Prone Areas

Flooding can be caused from stormwater ponding in low-lying areas; or waterbodies overflowing their normal channel in high rainfall events. Townships known to experience localised flooding include:

- Feilding | overflow of the Makino Stream, Ōroua River and the Kiwitea Stream
- Rongotea | School drain and stormwater ponding
- Kairanga/Bainesse | Taonui Flood Basin stormwater ponding
- Tangimoana | stormwater ponding

Manawatū District is bounded by two major rivers: the Rangitīkei (to the North and West), and the Manawatū (to the South). The Ōroua & Pōhangina Rivers and Kiwitea. Makino & Waituna Streams traverse through the district as well. All these rivers and stream can, and have, broken out of their channels during major flood events. Horizons Regional Council has done considerable work modelling likely outbreak point(s) to understand flood impacts from a number of these watercourses:

Flood action plans, prepared by Horizons Regional Council, outline a management of spillway operations into defined areas of high flow river levels of the Ōroua River and the Makino Stream. These documents are as follows:

- Makino Flood Action Plan
- Taonui Basin Flood Action Plan

Low-lying townships in southern Manawatū may also be vulnerable to flooding from tsunami. Historically, tsunamis that affect New Zealand's coastline are triggered by earthquakes off the coast of South America or Japan. Horizons Regional Council has also modelled the Southern Areas of Tangimoana and Hīmatangi Beach to assess the risks associated with varying tsunami events. The modelled effects would be sea water encroachment into the settlements and for water to travel up the mouths of rivers such as the Rangitīkei river and the Kaikokopu Stream.

However, although the probability is low for any particular location, other parts of the Pacific rim frequently experience more destructive tsunamis. In 2012/13, 2 warnings were issued to New Zealand coastal environments due to earthquakes off South America and the Solomon Islands. Although no effects were noted, the probability exists of further activity affecting NZ.

A flooding risk assessment was included as part of the Manawatū-Whanganui Lifelines project. The assessment considered major lifeline services and the effects of Natural Hazards on them.

Landslides

Landslides are generally caused by slope saturation and can include mudslides, debris flow or avalanches, rock falls and rockslides. Increased ground saturation can be caused by intense rainfall, changes in groundwater and water level changes in rivers, earth dams lake banks and the coastline. Generally flooding and landslide events are closely linked as they both result from heavy rainfall, stormwater runoff and ground saturation.

The risk of landslide is influenced by a number of factors such as:

- Underlying geology
- Proximity to rivers, lakes and the coast
- Past and present land use including vegetation changes
- Infrastructure development

Landslides can result in significant adverse effects on the road network including blocking roads by material dropping onto the road or loss of the road because the supporting country and the road slip away.

Earthquakes

New Zealand is considered amongst the most seismically active places on earth, as it is located on an active boundary of two tectonic plates.

Active faults

In central New Zealand, motion of the Pacific Plate relative to the Australia Plate occurs at approximately 40mm/year in the direction of approximately 260°. The forces involved in plate movement are immense and cause rock of the Earth's crust to buckle (fold) and fracture (fault) in the general vicinity of the boundary between the plates. There are 5 known active faults in the vicinity of the Manawatū Region and all have the potential to cause strong shaking.

These active faults are:

- Wellington Fault, laying 27km southeast of Feilding
- Ruahine Fault, laying 24km southeast of Feilding
- Northern Ohariu Fault, laying 28km southwest of Feilding
- Mt Stewart-Halcombe Fault, laying 4km to the south of Feilding.
- Rauoterangi Fault, traversing through the Western side of Feilding

A Seismic Earthquake risk assessment was included as part of the Manawatū-Whanganui Lifelines project. The assessment considered major lifeline services and the effects of Natural Hazards on them.

Volcanic activity

Ruapehu is one of New Zealand's most active volcanoes, with ten eruptions since 1861. The eruptions aren't the only threat, there is a more serious threat from the volcanic mudflow called a lahar. In between eruptions, a lake forms in the volcano's caldera from melting snow. If a previous eruption has deposited a dam of ash, rocks and mud in the lake's natural overflow point, then the lake becomes dangerously full, held back only by the temporary dam.

Mount Ruapehu has erupted at least 10 times since 1861 (produced numerous lahars); the most recent of which occurred on 25 September 2007[27].

Volcanos and volcanic eruptions

Gases, Lahars, Tephra, Earthquake, Landslips: The New Zealand region is characterised by both a high density of active volcanoes and a high frequency of eruptions. Volcanic activity in New Zealand occurs in 6 areas, 5 in the North Island and 1 (one) offshore to the northeast in the Kermadec Islands. The volcanos of note to the Manawatū District are the cone volcanos of Mt Ruapehu, Mt Tongariro, Mt Ngauruhoe, Mt Egmont/Taranaki, and the caldera volcano of Lake Taupo. Typically, a number of types of hazards will result from a volcanic eruption. Each hazard poses different risks affecting different areas. This is the key difference between eruptions and the other principal natural hazards, floods and earthquakes. The most threatening hazards include pyroclastic falls, pyroclastic flows and surges, lava extrusions (flows and domes), lahars, debris avalanches and volcanic gases.

Pyroclastic fall deposits consist of material which rains out from an eruption column. Large fragments (blocks and bombs) follow ballistic trajectories and are highly damaging. These fragments rarely land more than two kilometres from the vent. Finer material (ash and lapilli) is convected upwards in the eruption column before settling out downwind to form pyroclastic fall deposits. Fine ash can be deposited hundreds to thousands of kilometres from its source, and volcanic ash is the product most likely to affect the largest area and the most people during an eruption. These particles commonly have sharp broken edges and volcanic ash is therefore highly abrasive. Volcanic ash clouds will block out sunlight and total darkness may result where moderate to heavy falls of ash occur. A community's infrastructure provides the services and linkages which allow society to function.

These 'lifelines', such as electricity, water, sewerage and roads are vulnerable to damage from ash falls. Falls of volcanic ash, for example, have the potential to disrupt electricity supply. Loss of supply commonly occurs when ash is wet, as a result of rain during or immediately after the ash fall.

Contamination of open water supplies occurs, even in relatively small ash falls. Both turbidity (suspended material) and acidity are the most common problems affecting water supplies, but they will usually return to normal levels within a few hours or days unless ash falls are prolonged. Hazardous chemicals from ash can mix with small volumes of water such as roof-fed water tanks, stock water troughs and shallow surface water bodies, causing chemical contamination above safe guidelines for drinking water. Volcanic ash falls can cause severe damage to sewage and stormwater systems. Ash is easily washed off impervious surfaces, such as roads, carparks and buildings, into these systems.

[27] https://www.geonet.org.nz/about/volcano/ruapehu

Volcanic ash falling on roads is extremely disruptive to transportation, reducing visibility. The ash is easily raised in clouds by passing vehicles and this presents an ongoing visibility hazard.

Wet ash can turn into mud, causing further problems with vehicle traction. Fine ash causes clogging of air filters resulting in cars overheating. Vehicle brakes are susceptible to damage and ash may also enter the engine causing wear on moving parts, which reduces vehicle life. Even minor ash fall (<1mm) will close airports. Ash has damaging effects on other electrical or mechanical systems.

A Volcanic risk assessment was included as part of the Manawatū-Wanganui Lifelines project and included in the table following. The assessment considered major lifeline services and the effects of Natural Hazards on them.

Business continuity

Business Continuity is a progression of disaster recovery, aimed at allowing an organisation to continue functioning after (and ideally, during) a disaster, rather than simply being able to recover after a disaster. The following plans have been developed to ensure business continuity:

- Effects and Responsibilities Plan; Effects and Intervention for Transportation: The principal objectives for the Transportation Lifelines Response plan associated with Manawatū District Council (MDC) Transportation are:
- Possess a management tool that identifies natural hazards for Transportation
- Identify the consequences of the natural hazards
- Identify immediate remedial actions
- Define restoration levels, priorities and issues
- Identify long term risk management issues

Civil defence emergency management

The Civil Defence Emergency Management (CDEM) Act 2002 requires Local Authorities to coordinate Plans, Programmes and Activities related to CDEM across the areas of Risk Reduction, Readiness, Response and Recovery. It also encourages cooperation and joint action within regional groups.

A Lifelines Response Plan has been prepared for key Council services including Transportation. The Plan considers natural hazard events including earthquake, flooding, volcanic and mass movement (land slip).

Emergency works

Under the road maintenance contract, the Contractor is required to attend to all emergency work as soon as existing sites can be made safe and may be required to establish emergency patrols during periods of expected damage to facilities.

Emergency works may arise from adverse weather events like storms that result in wind damage, flooding, slips and snow. Work associated with these events is generally completed, even if this means that there is expenditure over the budget or other routine work is deferred to keep overall expenditure within budget. This is particularly relevant for safety related works and works that are needed to restore and reopen roads.

The Council applies to NZTA for additional funding for emergency and permanent reinstatement work resulting from weather events under Work Category 141: Emergency Reinstatement. This funding allows the Council to repair carriageway and structural damage caused by severe weather to at least as good a standard as previously existed before the weather event.

Operational structures and support operations

Asset operations are activities that do not have a direct physical effect on asset condition but are necessary to keep the asset appropriately utilised by the timely and professional input of engineering knowledge and the use of activity management systems. This activity distinguishes it from maintenance activities, which directly affect asset condition and performance. Costs such as power supply to streetlights and professional services are often defined as operational costs.

Professional services

Professional services for most renewal and new improvement works are regarded as project related and form part of the overall cost of those projects.

The current structure of the infrastructure services originated from a review undertaken by Morrison Low and associates in 2002. This review recommended the creation of the in-house professional services unit, and this was established in 2003. Roading professional services were the primary driver, but the utility groups of water, wastewater and stormwater were also incorporated. The Strategic activity management functions are a separate function operating in the infrastructure group. A further revision of this structure, in 2009, saw the development of a shared services function that provided infrastructure activity management and professional services provided for the Rangitīkei District Council.

The Strategic Activity management unit is responsible for providing strategic long term planning functions, such as the preparation of Activity Management Plans, input into the Long Term Plan, and the Infrastructure Strategy.

NZTA provides the guidance, via the Programme and Funding Manual, for the setting of fees for Professional Services. Generally professional services provide for the service fees relating to maintenance and operations. Operational fees include the professional services necessary to:

- Manage the roading network, including all maintenance activities
- Prepare contracts for the works and services needed to deliver the agreed levels of service
- Legalise existing road reserves
- Produce project feasibility report (PFRs) for capital projects
- Investigate rehabilitation
- Manage preventative maintenance

NZTA Work Category 151: Network and activity management under the Council's subsidised Land Transport Programme is where funding is sourced for professional services for Maintenance and Operations of Local Roads. This category does not include emergency reinstatements.

For the other main activity classes associated with the Council's subsidised Land Transport Programme Renewal of Local Roads, and New and improved Infrastructure for Local Roads, professional services costs form part of the individual work category budgets that fall under these categories.

Professional services costs are incurred by the Council's Transportation Strategic activity management team, and any external consultants the Council engages. These activities are all subsidisable provided the works themselves are subsidisable.

Professional services costs for non-subsidised activities are fully funded by the Council, including professional services and system costs for all unsubsidised maintenance, renewal or improvement works.

Staff structure

Council's road and bridge assets are managed by the Roading Asset Manager who works with the Roading Operations Manager and other roading staff to discharge all their responsibilities for operational, daily, short- term, medium-term and strategic planning of the road network and its maintenance. Road network professional services are largely delivered by in-house staff, who are accountable to the Roading Manager.

There are a number of cross-departmental links that are important to the correct functioning of the roading team and management of the roading network. The most significant of these are with the Financial and Administration Services staff.

Staff competencies

An important measure of the quality of Council's activity management is the ability, experience and qualifications of the individuals and companies involved in its preparation. Council employs a limited range of technical staff qualified to carry out the activity management function.

In this context competency refers to applied knowledge, it is not just the knowledge itself. Competencies can be described as: The behaviours that employees must have, or must acquire, to input into a situation in order to achieve high levels of performance.

There are a large number of competencies that the Council requires of its staff to effectively manage its transportation network assets; these are not statements of current individual's skills or competencies; rather, they are statements of the Council's desired competency in the areas and subjects detailed.

Establish the gaps between the competencies of current staff and the competencies required in the organisation. These gaps will be used to guide staff training and development programmes. Inform the recruitment process for staff involved in road activity management when new positions are being filled or replacement staff sought.

LTP planning

To ensure that staff were thinking and working towards a common LTP goal, Council management instigated a LTP planning process early in 2022 for the 2024-54 LTP. The group consisted of senior managers, LTP planners, asset managers and accountants. This group meets regularly and provides direction on issues such as:

- Council priorities
- Agreed assumptions
- Growth projection
- Plan format and style
- Communication and consultation
- Auditing processes

Council and committee structure

Council's committee structure is extensive and are established under the LGA 2002. Each township, excluding Feilding, and rural community also has a local Community committee elected every three years at a specially convened public meeting. The purpose of the committee is to consult with its community and relay local concerns and preferences to the Council. Township services and beautification projects are generally undertaken in conjunction with, or at the behest of, local township committees. The full list of the Boards and Committees has been previously described under Part C | Section 1.2.2.

Audits

To establish and ensure the on-going improvement of the quality of Council's systems, audits of financial, technical and performance systems are routinely implemented by NZTA, Audit New Zealand and Vertitek (streetlight inventory audit on behalf of the electricity retailer).

Financial audits

The LGA requires that independent annual financial audits be undertaken on the operations of Council – such audits may include all significant activities such as Activity Management Planning. The auditor's opinions are included in the Annual Report.

Information system audits

System audits are undertaken at regular intervals to access the appropriateness and performance of activity management systems, data and processes.

Audits should identify the current status of activity management processes, systems and data and produce targets for Activity management practices to be achieved in following years.

Technical audits

Technical audits (peer reviews) are undertaken by NZTA at regular intervals to assess and identify compliance with statutory requirements.

Performance audits

Performance audits will establish whether the stated objectives for the operation of the asset have been achieved. Measurement of the success of the operation of the asset will be assessed using the results of:

- Customer satisfaction surveys
- Key service criteria objectives compliance
- Benchmarking surveys

These measurements will determine the public view of how well the levels of service have been achieved, an objective measure against stated key service criteria and national measures of relative performance. The performance audits will also be used in on-going customer consultation regarding future standards and requirements of the customers in the provision of service.

The collation of this data is often undertaken as part of NZTA's national role in monitoring performance of transportation agencies.

Operational improvements

When a non-conformity or incident occurs in assets, activity management or activity management system Council will:

- React to the non-conformity or incident as applicable, take action to control and correct it and deal with the consequences
- Evaluate the need for action to eliminate the causes of non-conformity or incident by:
- Reviewing the non-conformity or incident
- Determine causes of non-conformity or incident
- Determine if similar non-conformities exist, or could potentially occur
- Implement any action needed

Root Cause Analysis is a technique that examines why the problem occurred in the first place. It seeks to identify the origin of a problem using a specific set of steps, with associated tools, to find the primary cause of the problem, to determine:

- What happened
- Why it happened
- What can be done to reduce the likelihood that it will happen again

Identifying Systemic Issues highlights problems or changes in Council/NZTA policy or practice that affects, or has the potential to affect, a number of customers. It may be caused by, but isn't limited to, one or more of the following:

- a system change
- an alteration in performance levels (e.g., quality of supply, access to call centre)
- a policy or procedure change
- a lack of policy or procedure
- a lack of clear regulatory guidelines
- regulatory non-compliance
- the conduct of an energy or water provider's employee, agent, servant, officer or contractor
- the action of a stakeholder (e.g., legislative or regulatory change leading to misunderstanding or misapplication of the change)

If any systemic problems are identified, a plan is implemented to correct the potential faults before failure occurs. Continuous improvement: is a method for identifying opportunities for streamlining work and reducing waste. Continuous improvement can be viewed as a formal practice or an informal set of guidelines that has the following principles:

- Improvements are based on small changes, not major paradigm shifts or new inventions
- Ideas come from Council and Contractor's employees
- Incremental improvements are typically inexpensive to implement
- Council and Contractor's employees take ownership and are accountable for improvement
- Improvement is reflective
- Improvement is measurable and potentially repeatable

4.2.11 Developing renewal programmes

4.2.11.1 Road improvements

Road improvements include activities that target a specific increase in levels of service in part of a roading network.

The road improvements activity classes include Local Road Improvements under the following work categories:

- Work category 216: Bridges and structures renewals
- Work category 321: New traffic management facilities
- Work category 322: Replacement of bridges and structures
- Work category 323: New roads
- Work category 324: Road improvements
- Work category 325: Seal extension
- Work category 331: Property purchase – state highways

- Work category 332: Property purchase – local roads
- Work category 333: Advance property purchase - local roads
- Work category 341: Low cost, low risk improvements
- Work category 357: Resilience improvements

The required benefit and cost appraisal methodology for road improvements is benefit-cost analysis and the required measure is the benefit-cost ratio (BCR). NZTA requires Council to use the Monetised and Non-monetised Benefit and Cost Manual procedures and templates to determine the BCR for road improvement activities.

4.2.12 Capital investment planning

4.2.12.1 Introduction

Council uses NZTA's Business Case Approach (BCA) to guide its planning, investment and project development processes. The BCA is used to develop business cases for investment through the NLTP. The BCA provides flexible building blocks which can be adapted to particular situations and proposed investments.

NZTA assesses investment proposals in the 2024-27 NLTP using the information contained in the business cases and supporting information submitted in Transport Investment Online (TIO). After the business case has been assessed and passed, the information is then distilled down to two ranking factors,

- Results Alignment | The alignment of the proposal's key transport issues with the GPS, and
- Cost Benefit Appraisal | How efficient resources are used to deliver benefits from the proposed solution

The information relating to developing assessment profiles is organised by activity class groupings. NZTA provides guidance on each of the two factors within the groupings.

Identifying and scoping capital projects

NZTA assesses business cases at the end of the strategic case, programme business case and single-stage business cases phases (or after both the indicative and detailed business case, if they are done separately). This assessment uses the business case investment questions and the Investment Assessment Framework (IAF). The investment questions ensure that the business case will be effective and the IAF checks alignment to the strategic priorities outlined in the GPS.

Developing new build programmes

The business case is developed by answering the questions in the table on the following page. They don't all need to be answered at each phase, but the more advanced the business case is the more questions need to be answered. For the most up-to-date Business Case Approach guidance, visit NZTA's website.

Problem	*Benefits*	*Strategic response*	*Solution*
Strategic case		Programme business case	Single-stage business case, or indicative and detailed business cases
Is it clear what the problem is that needs to be addressed (both the cause and the effect)?	Have the benefits that will result from fixing the problem been adequately defined?	Have a sufficient range of strategic alternatives and options been explored (demand, productivity and supply)?	Consistent with the strategic alternatives and options, have a reasonable range of project options been analysed?
Yes / Maybe / No	Yes / Maybe / No	Yes / Maybe / No	Yes / Maybe / No
Is there evidence to confirm the cause and effect of the problem?	Are the benefits of high value to the organisation(s) (furthering its (their) objectives)?	Is it clear what strategic alternatives and options are proposed and the rationale for their selection?	Is the proposed solution specified clearly and fully (all business changes and any assets)?
Yes / Maybe / No	Yes / Maybe / No	Yes / Maybe / No	Yes / Maybe / No
Does the problem need to be assessed at this time?	Will the KPIs that have been specified provide reasonable evidence that the benefits have been delivered?	Are the proposed alternatives and options the most effective response to the problem (comprehensive and balanced)?	Is the proposed solution the best way to respond to the problem and deliver the expected benefits?
Yes / Maybe / No	Yes / Maybe / No	Yes / Maybe / No	Yes / Maybe / No
Is the problem specific to this investment (or should a broader perspective be taken)?	Are the KPIs both measurable and totally attributable to this investment?	Are the proposed alternatives and options feasible?	Can the solution really be delivered (costs, risks, timeframes, governance, etc)?
Yes / Maybe / No	Yes / Maybe / No	Yes / Maybe / No	Yes / Maybe / No

4.2.13 Compiling the capital investment strategy

The strategic case phase is about defining and understanding the problem or opportunity, and showing there will be substantial enough benefits to justify investment to investigate the problem further. Essentially, it asks 'Is there a case for change?'

The main purpose of the strategic case is to confirm whether:

- there is a compelling case for change to investigate further; that is, there is evidence that suggests there is a problem, and indicates the scale of the problem
- key stakeholders are aligned and behind the need to address an agreed problem
- agreement is forming on what a good outcome looks like and what benefits could be gained before effort is expended on investigating solutions

Strategic cases avoid wasted effort where agreement is not reached, or where stakeholders agree that the problem is not significant enough to proceed. This decision can be made at any point during development of the strategic case.

Strategic cases should clearly answer the following questions:

- What is the problem? Investment logic mapping (ILM) or other workshops used to gain an understanding of the actual problem (cause and consequence)
- Do the benefits of addressing the problem justify further investigation?
- How big is the problem? Examine existing evidence and information
- Is the issue important? to Council and its stakeholders (alignment with organisational goals, policies, strategies, etc)

It is essential that you craft your strategic case carefully so that it is clear and concise. The desire to tell a compelling story that will convince investors to commit limited public funds must be balanced against the need to be objective and maintain the integrity of the business case.

It is also important to put the investment story in a national context. The strategic case will be assessed along with many others seeking investment from a contestable national fund that has a finite amount of money.

4.2.13.1 Net present value analysis

The present value of future costs of options are determined and compared to identify the long term least cost option.

The method is recommended to determine if replacement/renewal is more cost effective than on-going maintenance. Where the future costs of the do-minimum exceed the costs of replacement/renewal then the net present value of the option can be assessed in the cost benefit appraisal as the best present value end of life approach. In certain cases, the use of benefit streams rather than future costs may be more appropriate.

4.2.13.2 Benefit cost evaluation methods | Approaches to investment evaluation

NZTA’s Monetised and Non-monetised Benefit and Cost Manuals are the industry's standard for the economic evaluation of land transport activities for New Zealand. These manuals set out economic evaluation procedures and values used in calculating benefits and costs, necessary for applications seeking investment where a benefit cost appraisal from NZTA is mandatory.

Decision making at the strategic, programme and project level operates with different degrees of sophistication as follows:

- Current status | The current condition is the driver in decisions, and is often associated with a worst first approach to investment
- Whole of life cycle costing | Future performance is the main driver in decision making, and requires condition prediction modelling over the whole of life analysis period
- Risk analysis | Involves consideration of multi-criteria but investment options are evaluated using a risk assessment method

4.2.13.3 Cost effective analysis business case approach

NZTA requires Council to use a business case approach to guide its planning, investment and project development processes. It is a principles-based approach that clearly links Council’s strategy to outcomes and defines problems and their consequences thoroughly before solutions are considered. This approach ensures a shared view of problems and benefits early in the transport planning process without requiring that the work has to be done in a particular way.

A business case approach encourages early engagement with stakeholders to confirm:

- The fit with strategy and need to invest
- The way forward with short-listed options
- That the best value option is affordable and deliverable and that the risks are acceptable

New programmes/activities in the NLTP are required to follow the business case approach.

A project's business case is built progressively; starting with a strategic case, then a programme business case, progressing to an indicative business case and finally a detailed business case, with decision points along the way that determine whether the investment is worthwhile in relation to the desired outcome. And at every step of the way, there's a strong connection between strategy and outcomes, whereby a:

Strategic Case sets the strategic context and presents a shared understanding of the scale and significance of problems, the outcomes sought, and the benefits desired. This stage is a central pillar to subsequent business case stages and enables NZTA to provide early investment signals to our partners. Investment logic mapping (ILM) is at the heart of this stage.

Programme Business Case identifies an optimal mix of alternatives and options but doesn't look at detailed solutions at this stage. The preferred programme could include a broad mix of activities that might be delivered by multiple parties over a period of time. This business case will receive official NZTA support, including assessment of strategic fit. An anticipated effectiveness and efficiency assessment is also undertaken at a programme level.

Indicative Business Case further develops specific activities. It provides a long list to short list of options, and it recommends a preferred way forward as part of the short-listed alternatives. An indicative business case receives official NZTA support, including assessment of strategic fit and effectiveness, with anticipated efficiency assessment.

Detailed Business Case confirms an activity that comes from the detailed programme (previously called 'package') of activities and confirms the overall assessment profile. It includes a more detailed reporting of economic, financial and commercial aspects of the activity.

4.2.13.4 Multi-criteria analysis (MCA)

Asset optimisation and prioritisation framework

Decision-making by Council entails identifying and assessing options with quantified and unquantified impacts, in a context of multiple objectives, constraints and uncertainty. Inevitably, a high level of subjectivity and judgment is involved, no system of decision-making can change this. However, the Programme Business Case approach provides a structured framework which breaks the decision-making process into stages and makes good use of data and analysis. This reduces complexity, adds consistency, rigour and transparency, and ensures that the best use is made of information.

There are a number of steps between performing the gap analysis and finalising the works programme. The ‘best’ option for each gap is chosen after an analysis of different funding options and scenarios. This analysis of scenarios considers asset optimisation and prioritisation or a combination of both.

Asset optimisation aims to maximise asset life and benefits (economic, social, safety, environmental or otherwise) while minimising the life cycle costs. Optimisation affects decision-making throughout the life of the asset from planning to renewal or disposal. Asset optimisation also takes into account the road use and infrastructure strategy, demand management and sustainability.

The WoLCC evaluates the total costs to be expended on an asset over its entire life span, expected life or service potential. The WoLCC economic analysis tool considers the costs, in present day value (PV), to NZTA, Council and the community throughout the life of the assets. The costs include annual maintenance costs, the timing and cost of future investments, such as rehabilitation, reconstruction and construction for additional capacity, and community costs such as road user costs. WoLCC compares alternative options with different economic lives. WoLCC is used to establish intervention levels for each ONRC category of road, taking into account traffic levels and geographical differences.

- The framework is simple and transparent, minimising both the level of information required and the necessary computation so that auditing and ease of use are maximised
- The framework is used for initial optimisation/prioritisation of a number of projects
- The results of the optimisation/prioritisation process are used to rank projects

The results of the outcomes developed from the framework are considered carefully for their credibility and whether there are other possible outcomes that are not provided by the framework. The long term programme is developed by expanding this process to include previous years' gaps that have not been filled due to insufficient funding and ongoing committed projects are also taken into consideration.

Ranking of Projects

Council ranks projects in order of importance based on a value-for money rating. The value-for-money rating incorporates:

- Economic benefits using optimisation to minimise total life cycle costs which cover agency costs, road user costs and other costs
- Adjustment for factors such as economic, environmental, safety and social which can only be measured subjectively
- A calculation of the life-cycle costs of various maintenance and rehabilitation treatments for the asset. In addition to engineering solutions, other solutions not involving physical works are also considered
- NZTA's Monetised and Non-monetised Benefit and Cost Manuals are used. These manuals set out economic evaluation procedures and values used in calculating benefits and costs, necessary for applications seeking investment where a benefit cost appraisal from NZTA is mandatory
- Non-quantifiable factors including economic, social, safety and environmental factors
- An iterative process to develop the optimum works programme dealing with constraints such as funding levels
- Development and management of a multiple year programme
- "Ground truthing" the framework to verify the results emerging from this process

Funding scenarios

After the total needs programme has been subjected to an optimisation and/or prioritisation process, a number of funding scenarios are generated to reflect a number of possible funding levels. The long term programme is then "smoothed out" to remove any unnecessary spikes in expenditure.

4.2.13.5 Risk-based decision making considerations

Risk-based decision making is made up of five major components, which are shown below.

Risk-based decision making involves a series of basic steps. The steps can be used at different levels of detail and with varying degrees of formality, depending on the situation. The key to using the process is in completing each step in the most simple, practical way to provide the information the decision maker needs. Some situations are so complex that detailed risk assessments are needed, but most can be addressed with more simple risk assessments. It is a process that organizes information about the possibility for one or more unwanted outcomes into a broad, orderly structure that helps decision makers make more informed management choices.

4.2.13.6 Other decision making considerations

The forward works programme

The final works programme shows the funding available for routine, preventative and periodic maintenance, as well as funding for rehabilitation and construction, including details of specific works for funding. As a final step in the programme development process the ranking list is reviewed to ensure that the high level policy decisions are reflected in the projects chosen for funding.

Renewal forecasts

Council prepares forward programmes for the resurfacing of sealed roads annually from information from RAMM. Unsealed roads are monitored continually, and work programmes are revised throughout the year in response to changes in need exhibited by the road surface, especially through the winter.

Specific forecasting assumptions

Initially the need for renewal works may not be so obvious compared to those associated with maintenance but the consequences of not recognising, planning and forecasting for the appropriate interventions can create a significant and expensive long term problem.

- The Council's policy is all new developmental roading shall be sealed. This affects expected future renewal costs
- Annual sealed road renewal costs will increase proportionately, and annual metal road renewal costs will decrease proportionately, with the length of seal extension completed in the previous financial year
- There will be no growth in unsealed road length. This is a reasonable assumption, as the Council's policy is all new developmental roading shall be sealed

Traffic capacity

As a whole, the network is not stressed, in terms of its ability to cope with present and foreseen demands. However, there are sections where its capacity is under pressure. This is evident from the following:

- Inadequate seal width for current traffic volumes and types of traffic evidenced by the increased need to repair the edges of some roads (e.g., edge break, edge rutting repairs), by an increase in concerns over safety of passing of heavy vehicles and an inability to pull onto the shoulder on some roads
- Lack of safe travelling-space for both cyclists and motor vehicles on some routes
- Concerns over the inability of opposing vehicles to pass safely on some increasingly busy unsealed roads and the lack of visibility for following-vehicles on these roads

A “Whole of Life” approach with a 30-year horizon has been taken to capture a representative portion of pavements that will reach the end of their life cycle. This approach is consistent with the legislative requirements for Infrastructure Strategies which require (as a minimum) 30-year forecasts and is also consistent with the role of the AMP. The decision making is evidence based., and an optimised programme of works has been developed that represents best value for money.

The Programme Optimisation process selects the right things to do at an appropriate level of investment (i.e., not over capitalising or over investing in treatments for the level of service or economic/social value of a road. Then implements them in the right way, at the right time and for the right price.

The Programme Optimisation process

- Addresses the Strategic Key Results Areas, Operational Measures and Performance Measures
- Sustains the network i.e., the major spend items are appropriate and tally with RAMM data
- Provides an appropriate level of treatment
- Ensures costs are reasonable (compared to other AOs with similar mixes of roads)
- Meets business case requirements
- Demonstrates how the ONRC is implemented as business as usual by 2018
- Identifies a long list of possible alternatives and options
- Develops a range of possible programmes, their benefits, consequences and potential costs
- Identifies a preferred programme of activities to progress

4.3 Assets

The following sections discuss the assets with detail around their specific lifecycle management requirements. The level of detail required for this plan varies as some asset groups have expansive technical requirements based on large amounts of data while others have minimal requirements with relatively low levels of management intervention required by the council.

The asset groups and their principal components are:

Road pavements

- Formation | the existing/ modified material supporting the sub-base and basecourse layers
- Sub-base| the lower structural layer between the formation and basecourse
- Basecourse | the top structural layer of the pavement
- Shoulders | grass and metal between seal edge and drainage feature
- Top surface | the bitumen bound chip seal or Asphaltic Concrete surface

Drainage

- Culverts | pipe system under roads to convey stormwater run-off
- Kerb and channel | concrete lined channels on urban streets/roads to control runoff
- Sumps and Soak holes | collection structures to control discharge of run-off
- Open water channel | earth formed v-drain beside rural roads

Storm water channel (or surface water channel)

- Kerb and channel | concrete lined channels on urban streets/roads to control runoff
- Deep and shallow surface water channels, predominantly on rural roads to control carriageway drainage

Bridges

- Abutments | fixed platform to support deck ends
- Piers | mid-point columns to support decking
- Deck spans | the trafficable platform atop the abutment and piers
- Large Culverts | pipe area greater than 3.4m^2 of cross sectional area

Retaining walls

Carriageway formation and support and protection structures.

Traffic services

- Signs | the message board to convey safety and directional information
- Posts | wooden or steel post to support the sign
- Markings | painted lines on road surface
- Islands | traffic control structures at intersections
- Rails | roadside site visibility and safety protection rails (fencing)
- Street Lighting:
  - Luminaires | light fitting including control gear and lamp
  - Poles | concrete or steel column to support the lamp
  - Brackets | supporting the luminaire atop the pole

Footpaths

Concrete, Paved, Asphaltic and unsealed pedestrian pathways.

Environmental

- Vegetation Control | control or grass and noxious plants
- Emergency Works | snow clearing, flood damage reinstatement, or other natural response
- Stock Underpasses | below ground structures to enable stock to pass under the road
- Street Cleaning | Detritus removal

Operation and asset management

- Activity management | strategic management of the roading network
- Systems | RAMM database to manage roading inventory
- Road closure | Council approved activities for community or sport events
- Traffic Management | function of operating on legal roads safely
- Corridor Access | permit approval system to operate of roads

The lifecycle management plans for each asset group detail the methods and actions planned to deliver the agreed levels of service while optimising life cycle costs. The life cycle management plans cover:

- Asset Information identifying
- The scope and nature of assets
- The current condition of assets
- The current capacity and performance of asset relative to the adopted level of service
- Demand projections and risk
- Management of, and standards for, all asset life cycle work activity – operations, maintenance, renewals, new improvements and disposals
- Costs and timing of identified work and forecast needs for all asset life cycle work activities (maintenance, renewal, development and disposal) required to action the adopted life cycle activity management strategies

4.3.1 Berm

Overview of Assets

The Berm is the grass area between the kerb edge and the property boundary in urban areas. Berms are identified by the type of plant cover. For the majority of Berms, the plant cover is grass but there are some areas planted with shrubs or flowers.

Modern subdivision construction methods normally allow for an area of grassed berm either side of the footpath but there are many other combinations depending on the position of the footpath and drainage channels.

Berms are formed when the road is constructed or reconstructed, and their renewal is normally included in these programmes.

There is an expectation that residents will maintain berms outside their properties so there is little ongoing maintenance required by the Council.

4.3.2 Bridge

The purpose of road bridges is to provide continuous all weather access over rivers, streams and uneven terrain, and grade separation over railway lines and other roads.

NZTA's definition of bridge includes structures such as major culverts if they have a waterway area greater than 3.4m^2, for a round pipe this is equivalent to the pipe having a radius of greater than 1.04m or 42 inches.

Overview of Assets

The Council maintains 241 bridges (including 101 major culverts) ranging in size from 2.1m Diameter culverts to bridges to up to 140m in length.

Bridge data is stored in councils RAMM database in the Bridge Table. Although large culverts are maintained as bridges, they are still deemed to be drainage assets with the asset information being stored along with other drainage assets in the Drainage Table. For ease of maintenance there is a link between the two tables, so large culverts appear in the bridge table along with bridges.

There are 9 bridges that straddle the district's boundaries. 3 are State Highway bridges which the Council has no responsibility for. The responsibility for the other 6 bridges are shared as follows:

Road Name	*Bridge Name*	*Plate Year*	*Management Responsibility*
Saddle Road	Saddle Road Bridge	2006	MDC/PNCC
Otara Road	Otara Bridge	1962	MDC/RDC
Mangarere Road	Mangarere Bridge	1966	MDC/RDC
Kawhatau Valley Road	Powerhouse Bridge	1975	MDC/RDC
Ruahine Road	Mangaweka Bridge	1899	MDC/RDC
Halcombe Road	Kakariki Bridge	1968	MDC/RDC

Some significant bridges provide access for agricultural transport while others provide for tourism and recreational activities. Other significant major river bridges in the district are on state highways and are administered by NZTA.

Bridges range in age from those constructed in the last decade to those constructed in the late 1800's. Most original bridges over the larger rivers were replaced with modern concrete and steel structures in the latter 30 to 40 years of the 20th Century, however some older timber deck bridges remain in service.

Major culverts generally serve smaller water courses and are of concrete construction and varying in quality depending on their age. 86% of the district's bridges were constructed between 1930 and 1979.

Bridges are constructed from various materials; timber was used on older structures with concrete and steel being used as time progressed.

Typically, timber was used for decks and steel for the superstructure, whilst piles utilised either material. This has created some difficulty with the long-term maintenance of bridge structures, as the different materials age and deteriorate at different rates.

Nearly all bridges are now constructed from concrete, utilising high quality precast components. Smaller timber bridges are being replaced with precast box culverts that can be quickly put into position.

Timber, including Australian hardwood that was the early material of choice for most bridges, is the least durable of all the materials available and is prone to rot, insect attack and natural defects such as cracking, splitting and in the case of timber decks, surface abrasion. Steel is more durable but is subject to rust and consequently must be well protected by surface coatings to prevent deterioration.

Concrete structures while potentially the most durable can suffer from carbonation and chloride attack, which can allow internal reinforcing steel to rust or concrete to degrade. Poor or inappropriate structural detailing and construction of concrete structures can significantly influence their longevity and the potential for expensive rehabilitation work during the life of the structure.

This is more prevalent in older structures where these types of defects have become evident by the passage of time. Key issues relating to the management of road bridges are:

- Older timber bridges reaching the ends of their practical and serviceable life spans
- Higher demands on older bridges from heavier and more traffic than originally anticipated when built,
- e.g., forestry, dairy, stock transport at 44t and 50t gross compared with 16t to 20t 40 years ago
- Maintenance liabilities with some types of older bridges from poor detailing and construction methods
- Increasing awareness of safety related issues with older bridges, e.g., single lane, inadequate approaches
- Guardrails
- Striking the correct engineering and social balance between an appropriate level of service and cost, e.g., bridge replacements or refurbishments
- Obtaining financial assistance (subsidy) for replacements or new bridges
- Obtaining resource consent for major works in or adjacent to watercourses under the Resource Management Act

Operational and Maintenance Processes Asset Performance Data

The correlation between current condition and remaining useful life could be more closely aligned. Currently the remaining useful life is assigned when assets are valued using a standard table relating to construction dates and type of construction. Improvement could be made in this data, so it is more aligned with condition rather than the construction date.

Maintenance Strategy

The objective of the works programme is to identify maintenance projects consistent with the overall Activity Management Plan.

It is important that the developed works programme and bridge strategy are consistent and realistic in terms of the overarching policy, goals and timeframes established by Council in this overall AMP.

In the context of bridge activity management, the optimisation of works programme is aimed at ensuring that the available budget is used in the best way to ensure that the risk and the possible consequence of any reduction in the level of service due to structure performance is minimised.

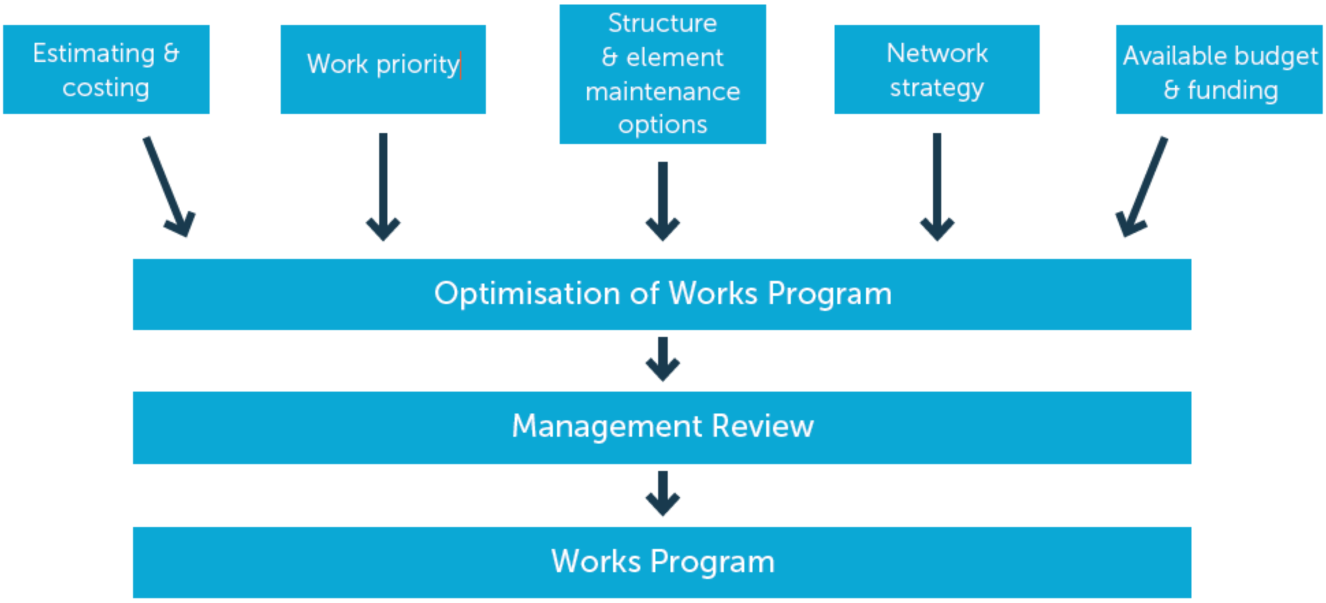
The ‘best way’ is identified by assessing the merit of various possible sets of maintenance projects proposed for the programme against the policy, aims and objectives of the road authority. Optimisation of the works programme is therefore achieved by identification and selection of the set of projects accorded the most merit.

At the strategic level the key objectives/goals for bridge activity management are:

- Plan and develop an integrated, safe, responsive, and sustainable bridge system
- The Activity Management Plan establishes the need for sound Activity Management Planning, with a focus on long-term asset sustainability

Maintain, operate and protect the road bridge system. Achieving this goal is the purpose of the life cycle management section of the Activity Management Plan – 'asset integrity' is a fundamental outcome.

Each of the elements shown below are inputs to the works programme that may be individually analysed and optimised to provide an overall benefit greater than the sum of the parts. The optimisation of the works programme is necessarily one of iteration and feedback in the quest for the best practical, economic and sustainable solution to many competing needs and objectives. As a consequence, the factors to be considered are many and varied and dependent on business practice.



Factors to be considered in the Optimisation Process include those relevant to:

- CLoS
- Standards
- network screening to identify candidate works/projects
- production of a long list of priority works/projects with ranking based on economic criteria, under budget constraint
- determining the necessary work programme to meet performance objectives
- economic (and financial) feasibility of alternatives for rehabilitation, new investment or capacity expansion

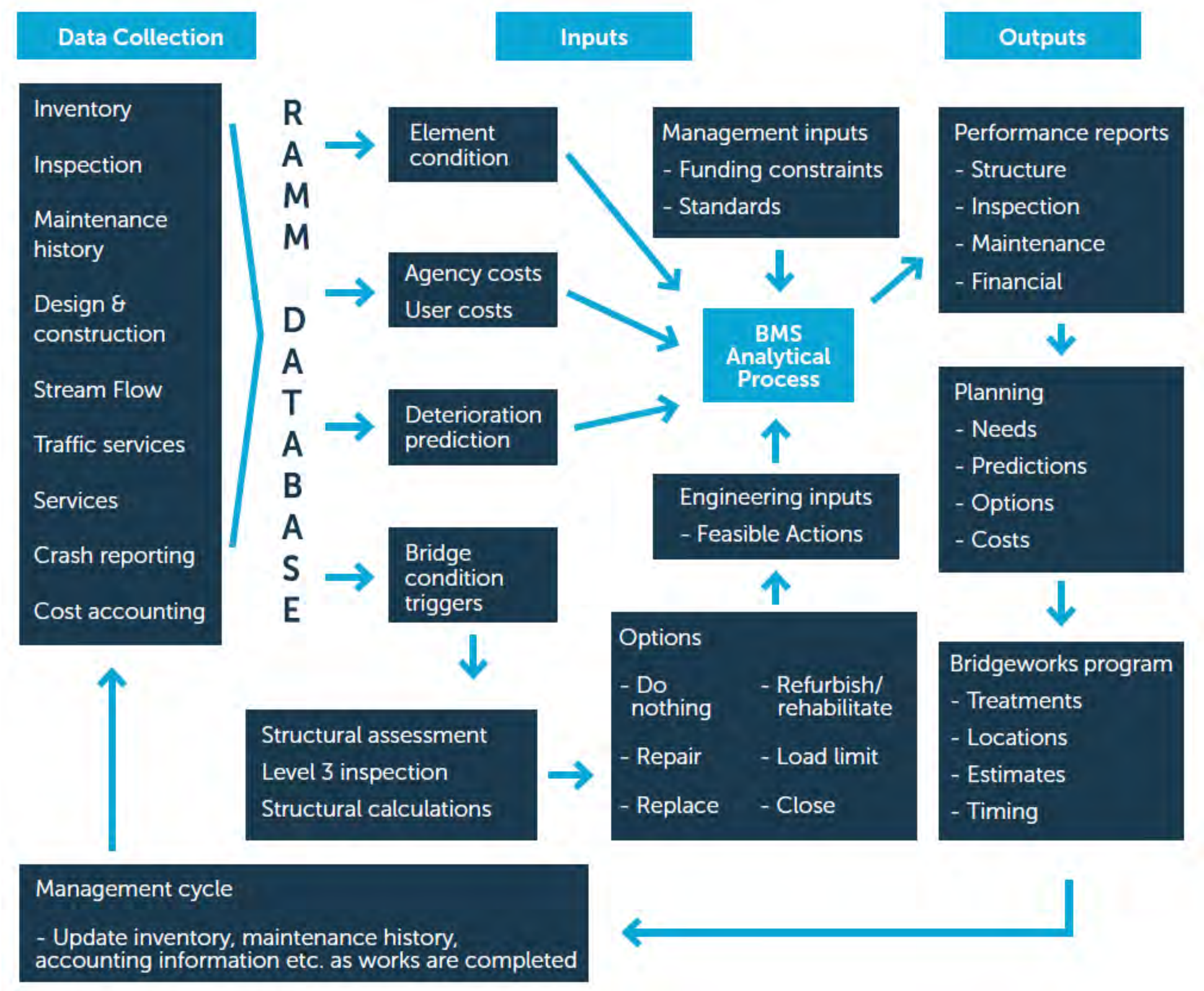
At a practical level, factors to be considered include those that determine:

- costs for the agency and user | from RAMM database
- bridge condition | from RAMM database
- deterioration prediction | from RAMM database
- funding constraints and minimum conditions | from management inputs
- feasible actions | from engineering inputs

The database contains information derived from the following activities:

- inventory
- inspection
- maintenance
- construction
- traffic surveys
- accident reporting
- cost accounting

The structure of a Council's bridge management system is shown below.



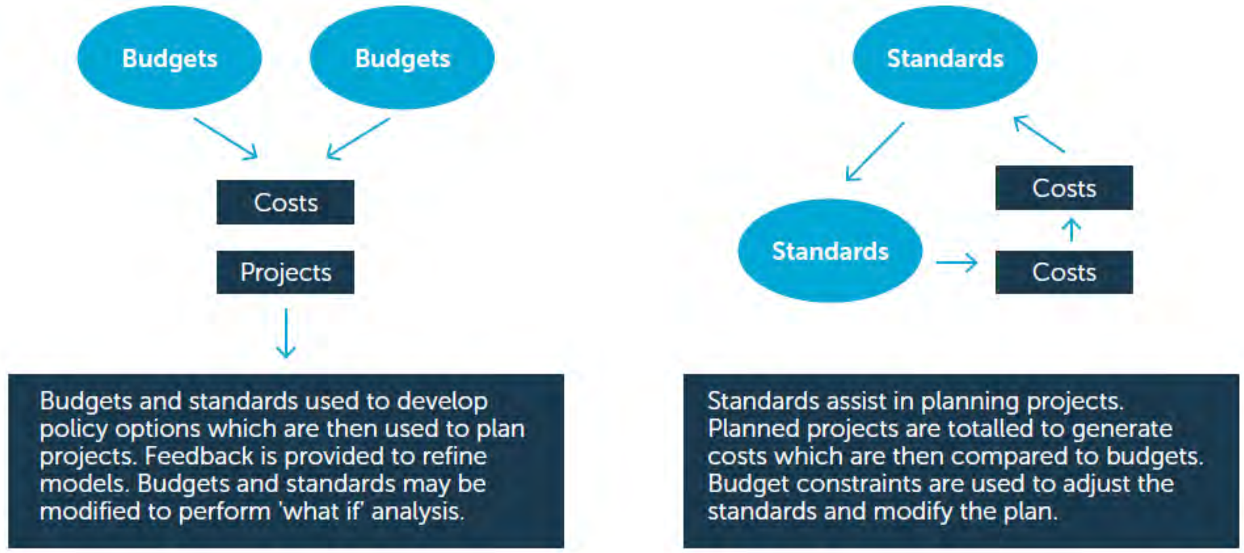
Programme Optimisation

The bridge works programme is developed in a systematic way. In general terms this is achieved through the application of a Bridge Management System (BMS).

The BMS is a tool that assists with information collection, storage and analysis. It is designed to support decision- making about optimal use of resources for bridge asset management. The BMS should provide reports that support the choice of the most beneficial set of bridge works for the works programme.

Optimisation determines the most beneficial strategy for bridge elements using lifecycle cost analysis or an equivalent procedure. Operated under various budget constraints, the system provides an indication of the effect of delayed maintenance on future element conditions and budget needs.

Optimisation may be either a top-down or a bottom-up approach. Each approach has its advantages and drawbacks.



NZTA Work Category

General Bridge Maintenance and Renewal activities are included in the Structures group and are managed under NZTA Work Categories 114 for Maintenance and 216 for Renewal activities. Large scale renewals are included in Work Category 322 Replacement of Bridges and Structures.

Inspection Programme

Scheduled bridge inspections are undertaken in accordance with NZTA requirements, this is done under contract by specialist bridge inspectors. Bridge inspection staff undergo structured training to ensure consistent results are reported. The inspection cycle is bi-annually for general inspections and on a six-year cycle for detailed structural inspections. The reports supplied include recommendations for any required maintenance or structural repairs.

Routine visual inspections are undertaken by the road maintenance Contractor under the Road Maintenance Contract and occur as part of the Contractor's general network inspection cycle. Inspections are also undertaken during and after events that might threaten the safety or performance of bridges, such as floods, earthquakes or overloading. The bridge inspection report includes recommended repair options, which are prioritised by the bridge inspector.

Council engineering staff assess the report findings, and the required work is either given to the road maintenance contractor to programme, price and action once approved by the Engineer, or contracts are let for more specialist structural repairs to be undertaken.

The Engineer is in the position of being able to co-ordinate the amount, type and cost of more complex and expensive work over the whole asset.

Maintenance programmes are developed from the schedules of defects identified during the inspections by both the Contractor and the Engineer. Repair treatments and priorities are determined by considering the impact on:

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

The works in the bridge maintenance programme are the most cost effective responses to the needs identified. From an activity management perspective, the additional criteria are also required, and are applied to:

- Protect the investment in assets by extending the life of the structure
- Minimise repair costs

In addition to the work identified through the routine inspections discussed above, other types of maintenance work can include:

- Repairing structural defects, e.g., concrete spalling, corroded fastenings, rotten timber, undermining of foundations
- Repairing or replacing damaged components, e.g., wheel guards and handrails
- Restoring protective coatings, e.g., painting
- Restoring or cleaning deck expansion joints
- Watercourse training
- Repairing road approach and abutment settlements
- Cleaning around bearings

Deferred Maintenance

The impact of deferred maintenance is:

- The inability to carry the design flows with a corresponding decrease in levels of service with respect to stormwater control, or
- The inability to carry normal traffic loads

The results of the current detailed structural inspection to be undertaken will determine with improved certainty the extent of any possible deferred maintenance.

Maintenance Standards

- NZTA Bridge Inspection and Maintenance Manual
- Relevant New Zealand and other standards for design, construction and workmanship

Asset Condition

All bridges are maintained a safe condition appropriate to their location, the road hierarchy and posted carrying capacity.

Condition inspections are undertaken in accordance with the NZTA Bridge Inspection and Maintenance Manual, taking into account such factors as structural integrity, defects, safety and appearance. The Bridge Inventory in the RAMM database is used for recording condition information and maintenance actions.

Bridge structural inspections are scheduled to occur at 6-yearly intervals with less intensive inspections undertaken at more frequent intervals by specialist bridge inspectors.

Based on current condition assessment information this shows the majority of the Council's bridge assets are generally in good or average condition. The assessment information used to determine condition rating is due to be updated as part of the next detailed inspection.

Bridge Expected Condition

Further work is required to produce a more accurate correlation between condition rating data and remaining useful life. One option for doing this is to structure Council requirements for information collected whilst carrying out inspections so that asset related data is checked and updated along with the collection of condition related data which may correspond to amendment of the remaining useful life of the bridge.

Weight Capacity

The imposition of weight and/or speed restrictions extends the remaining life until renewal or replacement is possible. It should not be expected that restricted bridges would be replaced just because a restriction has been imposed. For some bridges other solutions may be appropriate, because replacement may be uneconomic or unnecessary, especially if they provide access to a single property or very few private properties.

Restricted Load Bridging Assets

In 2010 the Vehicle Dimension Mass (VDM) Rule was introduced to allow the freight industry to move freight safely, on fewer vehicles, within an appropriately regulated and permitted environment. This was proposed as part of Central Government's direction to make the freight industry more efficient, free up capital for increased economic productivity and create more jobs. An increase of maximum vehicle loading from 44-tonne to 50-tonne was approved under the new rule.

Council undertook a review of all bridge structures to ensure they complied with the revised heavy vehicle weight limits; the following table summarises bridge restrictions as of July 2023.

Road Name	*Bridge Name*	*Bridge ID*	*Waterway Name*	*Weight Restriction*	*Speed Limit*
Coulter Line	Unnamed	S37	Ōroua River	44,000kg	N/A
Mangarere Road	Mangarere Bridge	S142A	Rangitīkei River	34,000kg 6,500kg limit per axle	30kph
Otara Road	Otara Bridge	S173C	Otara River	6,000kg	30kph
Umotoi North Road	Unnamed	S299B	Horopito Stream	44,000kg	N/A
Piripiri Road	Water Drive	S434	-	6,000kg	N/A

Traffic Capacity

Most bridges on major roads are of sufficient size to accommodate anticipated traffic growth rates. The majority of these bridges are relatively modern and have two lanes.

Most single lane bridges are on low volume rural roads. Current and projected traffic demands show no significant issues that warrant bridge replacement or upgrading from one to two lanes, although from a safety perspective two lane bridges are preferable. Usually, the additional cost in providing two lanes is not warranted on roads with low traffic volumes.

Single lane bridges have less traffic volume capacity and provide a lower level of service than bridges with two lanes. However, not all single lane bridges are deficient in terms of the level of service they provide, on many roads a single lane bridge is all that is required.

The increasing emphasis being placed on providing for other modes of transport, such as walking and cycling, is highlighting potential safety problems with some bridges. These typically arise on longer bridges on rural roads (or road bridges on popular recreational routes) when the bridges are not wide enough to enable pedestrians / cyclists to safely traverse them in conjunction with other traffic.

In some instances, the design of replacement bridges needs to consider whether any additional width is warranted to allow for the passage of over width farm machinery in remote areas where there is no practical detour. To avoid safety problems care is required in these circumstances to ensure that the replacement bridge is clearly either single or dual lane.

Smaller bridges in rural areas are susceptible to increased traffic volumes and weights from the developments in these areas e.g., forestry and dairy farming. This could potentially have a flow through effect when forests reach maturity and are logged.

Waterway Capacity

There are no significant problems with waterway capacity. Any minor problems are generally isolated to the smaller bridges. As with traffic capacity, any upgrading in waterway capacity warrants consideration only when these bridges are replaced at the end of their serviceable lives.

In the hill country areas, river channels are well contained in gullies and other natural low points. Peak flows can arrive at some sites very quickly and at high velocity, dependent on the intensity and duration of the storm event in the contributing catchment area. This can put significant pressure on waterway protection works and abutments, which can result in damage or losses. The unstable nature of silty soil types found in the northern parts of the district also has an impact on the bridge structures located in those areas during severe weather events.

In the southern low lying parts of the district low grades dictate meandering rivers and streams which are susceptible to flooding after high rainfall in the northern catchment areas.

Bridge Renewal/Replacement Plan

Asset renewal is undertaken when a bridge, or a significant component of a bridge, has reached the end of its economic life. This is measured by either its condition or performance.

The types of renewal work undertaken include:

- Replacement of an entire bridge
- Replacement of individual major bridge components e.g., deck beams, piers
- Rehabilitation of bridge components that restores the structural integrity of components, e.g., reinforcing repairs

Renewals are undertaken for the following reasons:

- The entire bridge has deteriorated to the extent that it no longer has the strength to carry its design loads (normal traffic) safely. (As all bridges were built to carry the normal maximum legal load that prevailed at the time, current lack of capacity is generally the result of deterioration or government imposed increases in axle and vehicle weight limits)
- Major components have worn or decayed to the extent that they are preventing the bridge carrying its design loads
- The waterway's characteristics have altered to the extent that the bridge can no longer pass the design flood flows

- Flood or earthquake damage has displaced or irrevocably damaged the bridge
- Major vehicle impact damage

When a bridge is replaced with a significantly wider or stronger structure the portion of work that is effectively increasing the level of service is classified as an improvement work.

Renewal and replacement needs are identified, and renewal priorities allocated, from inspections and in particular specific structural inspections. The economics of renewing these bridges are then reviewed by looking at the net present value of the various options, including the “do minimum” option, for a 25-year analysis period.

NZTA have recognised the problem of the increasing amount of deferred bridge renewals and developed evaluation criteria relating to “Bridge Replacements on Low Volume Roads” allowing easier and simpler funding justification of individual bridge replacements. These requirements are detailed in SP2 of the NZTA Monetised and Non-monetised Benefits Manual. This procedure now allows funding of the Council’s individual bridge replacements, to a value of $200,000, to be more easily justified. Despite this some bridge replacements may not be justified, for example if a detour less than 5km long is available.

Bridge renewal costs include the cost of the consents required for the bridge’s construction.

Uneconomic Bridges

NZTA, in addition to the criteria allowing funding of bridge replacements on low volume roads, also has a general policy regarding uneconomic bridge renewals. A bridge is considered uneconomic by the NZTA “where the ratio of the total cost of the work to be undertaken per AADT is greater than or equal to $8,000 per vehicle”. However, under this policy financial assistance will be provided for the most cost effective maintenance option.

Economic assessment of bridge renewals also requires the corresponding portion of road serving the bridge to be considered. The NZTA policy goes on to state: “On application, the [NZTA] will consider the eligibility of non-maintenance activities on uneconomic roading facilities for financial assistance on a case by case basis.”

There are no bridges currently considered uneconomic in the district.

Bridge Replacements

Bridge replacements are assessed on a “case by case” basis. Council is aware that ratepayers do not appreciate a bridge not being replaced, as it is deemed an unacceptable reduction in level of service. In rural areas, bridges in more remote areas are used for moving stock and farm machinery along public roads and are seen as vital for this purpose. In the case of moving stock, the use of fords or long detours is usually not an acceptable alternative.

Bridge Renewal Forecast

The assessment of long-term renewal needs requires an understanding of the performance and condition of each of the bridges, especially those of the larger and more complex structures.

Bridge Renewal is budgeted under NZTA Work Category 216: Bridges and structure renewals. Council’s bridge renewal strategy has prioritised 26 bridge renewals over the next 20-year timeframe; all structures identified are closely monitored under the bridge inspection programme.

The assessment of long term renewal needs is based on the currently assessed expected useful life, however, these may alter depending on how the structure is managed long term. For example, a renewal of a particular component of the bridge may extend its effective life beyond that assessed at this time.

From analysis of Council's RAMM data the long term theoretical renewal requirements for the bridge network were established. The expected useful lives used to establish this data are detailed in Council's Road Asset Valuation Report and are generated in the RAMM database.

As the replacement cost bridges and large culverts is significant it is important that future financial forecasts for their replacements are as accurate as practicable.

Bridge New Improvements

The background influences and methodologies applying to bridge new improvements are essentially the same as those detailed for pavements.

New Improvement works fall into the following categories:

- Construction of new structures to allow land development or to achieve traffic efficiencies by providing links across significant features (waterways, grade separation – roads under and over, etc)
- Upgrading of existing structures to carry increased traffic or heavier loads than they were originally designed for

Provision of new bridges as part of land developments. These are normally fully funded by the site developer.

Development Strategy

Council will only consider constructing a significant new bridge if the project is subsidised by NZTA.

The total benefits to road users and the land transport system, cost benefit ratios and first year rates of return are all calculated using the economic evaluation procedures found in the NZTA's Monetised and Non-monetised Benefit and Cost Manuals. If prioritisation is required, it will normally be by ranking projects in terms of the NZTA's funding criteria.

Council may contribute to the cost of a non-subsidised bridge on a public road if there are strong reasons why it should be built, and provided the cost to the Council does not exceed its share if the bridge had been subsidised, though the Council may contribute less where there is reduced benefit to the wider public.

New bridges can also be funded through Development Contribution and Financial Contribution levies on new land development and subdivisions. These can be required in situations where a bridge is necessary to improve the roading connectivity between and within new and expanding development areas.

4.3.3 Crossings

Overview of Assets

Crossings are the vehicle or pedestrian access ways between the road edge and property boundary, pedestrian pram crossings are also included in this data set. Crossings are recorded based on their type; bevelled kerb crossing, heavy duty vehicle crossing, pram crossing, etc.

Pedestrian Pram crossings are an integral part of the Footpath they are managed in the same manner, this is discussed later in this section under the Footpath Section.

Vehicle crossings that provide access to private properties are installed to Council specifications by approved contractors when properties are developed or subdivided. The cost of the crossing is borne by the property owner or developer and the completed crossing is vested to the Council. The exception to this is where the Council undertakes an urban street upgrade which includes new or replacement footpaths and vehicle crossings.

4.3.4 Drainage

Lifecycle Management | An Overview

The purpose of drainage assets is to contain and then convey surface water away from the carriageway keeping the road sub-surface dry to minimise water damage. Waterlogged pavements deteriorate rapidly so good drainage is necessary to minimise premature pavement failure and the associated maintenance costs.

Good drainage performance generally requires:

- **Catchment coverage** | In urban areas surface water channels and ponding areas should have kerb and channel and piped stormwater systems installed. Kerb and channel at the edge of the carriageway protects and defines the seal edge as well as collecting stormwater
- **Stormwater carrying capacity** | Capacity of the kerb and channel is not a problem as long as sufficient sumps and outlets are installed. This is one of the reasons low profile kerbs can be used as the standard profile for new construction, unless a specific stormwater design requires the use of a standard high profile channel
- **Water tightness** | The channels need to be able to carry the water to the sumps and outlets. Old or damaged channels allow water to get into the subgrade, and over time cause failures to the adjacent pavement, these channels need to be repaired or replaced before serious pavement damage occurs
- **Conformity with current standards** | Deep channels cause safety problems in urban areas as they are not easily negotiated by pedestrians or other footpath users, e.g., mobility scooters and wheelchairs
- **Ease of cleaning** | Channel covers used for crossings over deep kerb and dish channel can cause problems when cleaning as debris can be caught underneath the covers. Dish channel and non- standard channels also cause problems when cleaning with mechanical cleaners
- **Ease of crossing installation** | Non-standard profiles cause problems with crossings. The shape of the channel is often such that a cut down cannot be used, or standard sump-covers do not fit. As a result, special covers need to be made or standard covers are installed with the approaches modified to allow their use, in both these cases costs increase.

In urban areas drainage assets are generally constructed of concrete and convey surface water to reticulated storm water systems. Surface water channels, catchpits, culverts and sump leads are deemed roading assets up to the point where the flow of water joins the reticulated storm water system.

In rural areas drainage assets are designed to convey water to the nearest natural or formed water course via roadside drains and culverts where it is necessary to direct water under the road or driveway entrances.

Horizons One Plan | Stormwater Discharge

With respect to the management of stormwater runoff from the roading activity, the Horizons One Plan defines the activity to be in accordance with the discharge of stormwater into surface water pursuant to s15(1) RMA or onto or into land pursuant to ss15(1) or 15(2A) RMA, and any ancillary takes or diversions of stormwater pursuant to s14(2) RMA forming part of the stormwater system. All activities are monitored to ensure that no new, or existing discharge activities are adversely affecting, or causing affect to the quality of the receiving environment.

Distinction between Roading and Utilities

Urban

Council has made a clear distinction between the stormwater collection, treatment and disposal requirements of the Utility Networks and Transportation Networks assets in urban areas.

Roading Drainage Assets

These are the initial carriageway collection facilities within road reserve associated with catering for drainage from the carriageway that deliver the stormwater to a point of mains reticulation, treatment and/or disposal, they can also carry stormwater from roofs in some urban areas. These assets include:

- Kerb and channel*
- Surface Water Channels (mostly rural drains)*
- Culverts*
- Catchpits (sumps)*
- Bubble up sumps*
- Piped connections between the above

Utility Stormwater Assets

These are the reticulation, treatment and disposal facilities both inside and outside road reserves and include:

- House lot laterals (reticulation)
- Manholes (reticulation)
- Main disposal pipe work (reticulation)
- Formed swales or drains (treatment)
- Soak holes (disposal)
- Interceptors (treatment)
- Wetlands, retention ponds (treatment)
- Discharge from wetlands, retention ponds etc. (disposal)

NOTE: Assets marked * are currently recorded in RAMM and are considered to be roading assets.

Most facilities located beyond the boundary of the legal road reserve in urban areas are assumed either to be Utility stormwater assets or owned privately, for example systems within private rights of way. However, compliant discharges from these systems are accepted into road drainage collection systems.

Rural

In rural areas carriageway drainage is purely a transportation/roading responsibility as there is little threat to subsurface water quality from any carriageway runoff due to the inherent treatment systems that occur with the side swales and open drains that are commonly present. The exception is any rural or rural-residential subdivisions where a specifically consented stormwater system occupies legal road reserve.

Operations and Maintenance Plan

NZTA Work Category

Drainage Maintenance and Renewal activities are funded under NZTA Work Categories 113 for Maintenance and 213 for Renewal activities.

Service Delivery and Rationale

Routine Works include:

- Cleaning of culverts, including inlets and outlets, slot drains, subsoil drains, shoulder cut-outs (or placing as required), flumes, sock drains, and roadside drains other than water channels
- Cleaning of minor blockages in water channels that can be accomplished (in the opinion of the Engineer) with hand tools
- Cleaning of vehicular access culverts
- Cleaning of grates and sump tops
- Cleaning of sumps, manholes, cesspits, and catchpits/soakpits
- Cleaning/replacement of culvert markers including placement of the relevant culvert number

The following sections discuss Culverts, Catchpits, Kerb and Channel and Surface Water Channels which are sub asset groups of the drainage asset base.

4.3.5 Drainage | Culverts

Lifecycle Management | An Overview

The purpose of culverts is to convey natural watercourses or stormwater across the road without adversely affecting the pavement or surface of the road or disrupting its use. They are distinguished from bridges by having formed bases in place of the stream bed (water flowing under bridges flows in a natural bed).

Culverts have a waterway area less than or equal to 3.41m^2 or 1,040mm radius. Culverts larger than this are classified as bridges and are often referred to as either “bridge culverts” or “major culverts”.

Culverts are generally long life assets that show little sign of deterioration until failure if they have been correctly installed. The exceptions can be:

- Armco (galvanised steel) culverts carrying peaty or swampy water, which is often quite acidic. In these circumstances, the acidity attacks the galvanising and removes it over a decade or so, leaving an unprotected steel surface thus shortening the culvert’s life
- Older butt jointed concrete culverts that do not have the modern spigot and socket rubber-ring sealing system between the pipes. Butt jointed pipes can allow water to escape, eroding the surrounding pavement formation, which can, in turn, create subsidence of the carriageway or can contribute significant land slope failures causing sections of road to drop out on hillsides

Overview of Assets

Culvert asset details are recorded in the Council’s RAMM database and are stored in the same table as other drainage assets.

Service Delivery and Rationale

Operations and Maintenance Plan: Culvert maintenance is the work necessary to keep the waterway clear of debris throughout the length of the culvert, its approach and discharge channels.

Council takes a proactive approach to culvert maintenance, through regular inspections and appropriate maintenance.

The requirement for culvert replacement and renewal is often identified from failure, creating the need for reactive maintenance.

Maintenance Inspections

The contractor is required to inspect all culverts as required to maintain the agreed level of service noted above. The inspections identify when maintenance cleaning is required and also replacement from failure which causes blockages that are identified when the culverts cannot deliver the level of service. Occasionally the Engineer may direct a culvert replacement as part of an upgrade of a stormwater drain or water race system.

The maintenance contractor is required to confirm culvert details in the asset register and update the location and condition rating data held. This information is to be used to create an inspection programme for high-risk culverts and to provide the structure for future condition ratings and inspections. To date the inspections have been undertaken, with results recorded in RAMM, the programme for future inspections is in development.

The results of the condition rating have provided a list of culverts that are in very poor condition and require programmed replacement, this is detailed further in the renewals section.

Culverts are cleaned where possible in conjunction with each inspection. Debris, including all litter, rubbish, detritus, flotsam and vegetation is removed from culverts so that normal water flow is maintained, and care is taken so that the culverts are not damaged during cleaning operations. Culvert inlet and outlet structures and the areas immediately adjacent to these are also cleaned.

Unplanned Maintenance: The road contractor is required to maintain an effective communication system and level of preparedness to ensure emergency works are undertaken as soon as possible after notification.

Planned Maintenance: Damaged and malfunctioning assets identified by Council staff, contractor reports or the public are programmed for repair according to the following criteria:

- Public safety
- Accelerated deterioration of the adjacent pavement is occurring, or is likely to occur
- Inconvenience occurring to road users, pedestrians and/or property owners
- Untidy appearance
- Optimisation of complementary work scheduling

Culverts that cross private entranceways, or side culverts, are the responsibility of the property owner, however, these are maintained at council discretion if blockage poses a threat to the carriageway.

Deferred Maintenance: The impact of deferred maintenance is accelerated deterioration of culverts, which can affect the structural integrity of the road pavements. Blockages in culverts can create a build-up of water, which can flow over carriageways creating a safety hazard and potentially damaging the carriageway.

A backlog of maintenance work has been identified though a recent condition rating and is detailed in the following pages under Asset Condition and Renewal Plans. Previously culvert inspections were carried out as part of other network inspections where maintenance requirements were only identified when blockages occurred. The backlog is due to a change in the way MDC manages culvert maintenance rather than an intentional deferral of maintenance work

Maintenance Standards: Currently there are no specified maintenance standards for culvert maintenance outside the maintenance contract. Work is carried out in accordance with good work practice using materials and profiles that conform to the adjacent sections of channel but also comply with the relevant current standards and specifications.

Renewal/Replacement Plan

Culverts are renewed when they are unable to perform their functions safely and satisfactorily to the agreed level of service. This can occur through breakage, corrosion, blockage, change in run off characteristics requiring a greater waterway capacity, and lack of length (often caused by end breakage over the years).

The need for replacement is determined by inspection and the monitoring of performance during periods of heavy rainfall.

As a subsurface asset, problems are often not apparent until these manifest themselves indirectly. For example, a breakage under the carriageway may result in localised settlement or slumping of the road surface. Usually when this occurs, it is evidence of a fault or defect that has been developing over some time. Problems are aggravated and failure rates increase when traffic loadings increase.

Asset Performance: Performance issues for culverts relate to:

- Pipe capacity
- Variable performance caused blockages
- Downstream channels being impeded by fences and debris build up beyond the road reserve
- The adequacy of supporting stormwater collection and disposal systems
- The types of pipes and jointing systems used
- Increasing heavy traffic volumes are contributing to early failures, e.g., dairy tankers in rural areas where older culverts may have been installed to a lower specification that would normally occur now

In addition, there can be safety issues around the lack of adequate barrel length restricting the flow of traffic by narrowing the carriageway.

Expected Lives: Drainage assets have default service lives of 80 years; this default value is applied for valuation purposes and does not factor variables like differing standards of construction and operating conditions which dictate service life and often premature failures. For example, an older type of culvert installed under a carriageway with high volumes of heavy traffic movement would likely fail earlier than the same type of culvert installed where there is no heavy traffic.

The expected life calculation is reliant on an accurate construction date for each asset so its end of life can be assumed. Most Council culvert data lacks accurate construction dates so this assumption cannot be made with certainty. An arbitrary date is added to assets with no construction date for valuation purposes, but as this is added across the board, there is little confidence in the valuation data for these assets. An item is included in the improvement plan to construe construction dates from known information for other assets in similar locations.

Renewal Plans: Future renewals will be based on the results of the current and future condition rating inspections.

Failed culverts will be replaced as needed and with adjustments to the budget made at the time. Expenditure forecasts prepared subsequent to such renewals will consider their effects.

Asset Improvement and Development Plan: New culverts required by developments are included in their pavements. These may be required to connect between sumps and stormwater treatment facilities. However, there is a difference between what is defined as a roading asset and that defined as utility stormwater asset.

The need for other new culverts generally arises from the need to improve or resolve identified drainage issues or as part of street upgrade and area wide pavement rehabilitation projects.

There is no formally identified need for new culverts that might be required to maintain the current levels of service.

4.3.6 Drainage | Sumps and catch-pits

Lifecycle Management | An Overview

Sumps and catchpits are used to remove stormwater from kerb and channel or other surface water channels when there is no suitable open watercourse available. Sumps by definition connect to a pipe and usually contain a silt trap. Sumps are also referred to as “catchpits” as a generalised description. Where there are no reticulated stormwater systems or natural flow paths stormwater is sometimes disposed of through soak holes. In urban areas “bubble up” sumps may be used to transfer water from a private property to the kerb and channel if there is no reticulated storm water system available, these systems use water pressure to force the storm water up through the sump to the kerb and channel.

The operation and maintenance of soak holes in urban areas is now seen as part of the Utility Stormwater asset because of the specific operational and maintenance requirements to maintain water quality standards. In rural areas carriageway drainage is purely a roading responsibility as there is little threat to subsurface water quality from any carriageway runoff, due to the inherent treatment systems that occur with the side swales and open drains that are commonly present.

The design of urban sumps has changed in recent times, to improve the trapping of sediments and contaminants. This has required the use of submerged outlets and other techniques before discharging to other treatment and disposal systems like swales, soakage basins and wetlands alongside the carriageway.

Overview of Assets

Data has been collected at different times with the different terminology used for similar assets. Assets details for those identified as sumps needs to be validated and added to the appropriate and consistent catchpit category, this is an item in the improvement plan.

Service Delivery and Rationale

Operations and Maintenance Plan: Maintenance requirements are easily accommodated under the road maintenance contract and respective street cleaning operations therefore it is sensible to have these retained and managed as roading assets.

Deferred Maintenance: The impact of deferred maintenance is the inability to carry the design flows with a corresponding decrease in levels of service with respect to stormwater control.

The maintenance contract is structured to ensure the level of service is maintained, there is currently no deferred maintenance.

Maintenance Costs: Street Cleaning activities are only partially funded under NZTA Work Category 113 – Routine Drainage in the Council's Land Transport Programme. Only 30% of the total expenditure of street cleaning within 2m of the edge of carriageway is eligible for funding. The remaining 70% has to be fully funded by the Council. This is included in the financial forecasts.

Renewal/Replacement Plan

Sump renewals, because they are so closely tied to kerb and channel renewal, and are relatively low cost items, are not programmed or budgeted separately.

Occasionally the need for replacement is determined by inspection and the monitoring of drainage performance during periods of heavy rainfall, however, sumps are normally renewed when the kerb and channel they serve is renewed. Parts of the original sumps may be reused, e.g., the piped outlets, this is done on a case-by-case basis and generally for practical rather than cost reasons.

The primary reason for renewing sumps is usually a consequence of street upgrade projects. Sumps are unlikely to be replaced in their existing positions when kerb and channel are realigned, and it could be argued that - in this circumstance – use of an improvement works category is most appropriate. However, as the capability to receive stormwater is retained in the approximate location being renewed, it is more appropriate to consider this work renewal.

Asset Condition: Sumps are generally in serviceable condition. They are not subject to any condition rating inspections but are inspected and cleaned regularly, this ensures they remain in a serviceable condition.

Asset Performance Data: There are no performance issues with sumps as long as they regularly cleaned. The greatest issue is build-up of leaf debris on their grates occurring in autumn. This can be a particular problem when strong winds and heavy rain coincide. This is a maintenance issue and is resolved through additional maintenance at the appropriate times.

More regular cleaning is also resulting from their increasing function to entrap sediments and contaminants as part of a consented stormwater treatment and disposal system in urban areas.

Expected Lives: As detailed above the replacement of sumps and catchpits is normally dependent on when the associated kerb and channel is renewed. The expected life of sumps and catchpits is aligned with kerb and channel and is set at 80 years.

The expected life calculation is reliant on an accurate construction date for each asset so its end of life can be assumed. Historical sump and catchpit data lacks accurate construction dates so this assumption cannot be made with certainty. An arbitrary date is added to assets with no construction date for valuation purposes, but as this is added across the board, there is little confidence in the valuation data for these assets. An item is included in the improvement plan to construe construction dates for kerb and channel assets, once this information is obtained construction dates for the associated sumps and catchpits will also be added.

New Sumps

New sumps required to service new kerb and channel in new developments are included in the costs of those works. These initial costs are borne by the developer with ongoing maintenance costs becoming councils responsibility once the assets are vested to council.

4.3.7 Drainage | Kerb and channel

The Council's RAMM database records information on surface water assets. Kerb and channel and other surface water channels are identified separately as they have differing attributes, maintenance requirements and valuation methodology.

Kerb and channel is a specific type of surface water channel. Its purposes are to:

- Provide a path for stormwater runoff from the carriageway, footpaths, berms and adjacent properties, protecting the pavement from water ingress, and consequential structural deterioration
- Allow the convenient and safe movement of pedestrian and vehicular traffic
- To enhance the convenient and safe movement of pedestrians and traffic by separating these two streams of road users

It also has an important secondary purpose; the use of concrete kerb and channel, as opposed to earthen surface water channels (also referred to as swales) is a recognised and accepted sign of urban development. With the flat profile of the district's towns, ponding can occur if well-formed channels are not used. Apart from its functional role, kerb and channel also protects the carriageway seal edge from the higher exposure to traffic within the urban area. It is a requirement of the District Plan that all new urban subdivisions have formed kerb and channel. In some of the smaller and more rural orientated townships kerb and channel may be seen as unnecessary, or not be wanted by the residents.

Kerbing is also installed at some rural intersections, bends and corners in conjunction with other road improvement works, such as minor improvements at intersections, seal extensions and seal widening. Kerbing in these situations protects the edge of seal from edge break problems in these high-wear areas while also providing positive drainage of stormwater runoff. In addition, kerbs delineate corners of an intersection to a higher degree than a plain seal edge.

All new kerb and channel is either standard profile kerb and channel, or mountable kerb and channel and is generally slip formed in situ. Mountable kerb and channel is used in the majority of situations, although it does not have the carrying capacity of standard kerb and channel, this is not considered to be a problem as suitability assessment is carried out during the design phase of construction.

Standard profile kerb and channel is used if there is a wish to match it with existing installations or if there is a requirement to have a higher stormwater capacity.

The mountable kerb and channel profile channel is less obtrusive than standard kerb and channel and allows normal residential vehicle access without the need to cut the kerb and install a dedicated vehicle crossing. It is the Council’s policy to provide kerb cut downs on the low profile kerb and channel in specific situations, such as crossing points for pedestrians, rights of way and commercial entranceways where there is a large amount of traffic, e.g., shopping malls and warehouses.

Kerb and dish channel is difficult for pedestrians, especially the elderly and mobility impaired to cross, and it can trap cycles and car tyres, is difficult to clean, its bridge crossings trap debris and are sources of ponding during heavy rain and it is unsightly. Nevertheless, Council regards it as filling a function and its policy is to replace it only when condition dictates, or as part of a street upgrade project.

The key issues relating to kerb and channel are:

- Implementation of a kerb and channel extension strategy that identifies missing sections or sections that need to be provided
- Determination of the amount of deferred maintenance and renewals of kerbs and channels
- Provision of appropriate stormwater collection, treatment and discharge facilities where necessary
- Compliance with Resource Consent conditions, imposed when maintaining, renewing and providing stormwater facilities

- Resource Consent conditions imposed on developers that will become the Council's responsibility when the assets themselves are vested in the Council by the developers and any resource consents transferred to it
- Asset data integrity (e.g., lack of accurate construction dates)

Service Delivery and Rationale

Operations and Maintenance Plan: Clean hard-surfaced channels carry stormwater more efficiently. Kerb and channel cleaning is therefore an important activity and is not just done for aesthetic reasons i.e., to make the channels look tidier. This work is carried out as part of the overall roading maintenance contract, which specifies the frequency and standard of cleaning.

There are periodic maintenance requirements that are not extensive enough to be classed as renewals, in particular, it is often necessary to repair stormwater outlets and occasionally to repair short lengths of broken or failed kerb and channel. These works are identified by the contractor, condition rating inspections, Council staff, or from ratepayer concerns or complaints. The work is carried out under the Road Maintenance Contract.

Condition Inspections: The Council's staff and the road maintenance contractor report any defects observed in day-to-day road maintenance activity. Condition surveys are undertaken annually by an independent contractor with results stored in the RAMM database.

Unplanned Maintenance: The road contractor is required to maintain an effective communication system and level of preparedness to ensure emergency works are undertaken as soon as possible after notification.

Planned Maintenance: Damaged and malfunctioning assets identified by Council staff, contractor reports or ratepayers are programmed for repair according to the following criteria:

- Public safety
- Accelerated deterioration of the adjacent pavement is occurring, or is likely to occur
- Inconvenience occurring to road users, pedestrians and/or property owners
- Untidy appearance
- Optimisation of complementary work scheduling

Deferred Maintenance: The impact of deferred maintenance is an accelerated deterioration of kerbs, channels and pavements with a corresponding low level of service with respect to appearance and stormwater control. They also become difficult to clean and can attribute to pavement deterioration.

Maintenance Forecast: The forecast cost of maintaining kerb and channel is largely derived from past experience.

Renewal/Replacement Plan

Replacing isolated sections of kerb and channel can be impractical, as it is likely also require the partial reinstatement of the adjoining footpath and pavements, and it is therefore best performed as part of an integrated programme. Kerb and channel renewals therefore usually take place in conjunction with the upgrading or reconstruction of the adjacent pavement sections, footpaths and berms, usually as part of street upgrade projects.

Strategy and Funding Mechanism: An appropriate renewal programme will be funded – maintenance costs will increase if renewals are deferred. Maintenance costs will increase in proportion to the increase in kerb and channel length.

Renewal Strategies: Street upgrade projects are usually seen as township projects, and as such become part of the identification and prioritisation processes that the Council engages in with Township Committees when it prepares its forward programmes. However, there are usually good engineering reasons supporting such programmes, often related to the state of the kerb and channel, and that can be significant contributors to the prioritisation process.

Renewal Standards: While much of the old channel is located at 3 metres from the road boundary, its replacement is optimised to meet current engineering and planning standards. This can require the width of the adjoining carriageway to be reduced from its original 14m or so to 11m or less, in accordance with the road's hierarchy and the corresponding standards.

Older streets also often have an area of metal or grassed shoulder between the edge of the formed carriageway and the old channel. In these circumstances the replacement kerb and channel is likely to be positioned at the immediate edge of the carriageway and a new berm and footpath created behind it. This has lower through life costs and is also more practical and aesthetically pleasing.

Replacement kerb and channel is installed to the same standards as new, using appropriate engineering standards and the same cross sectional profiles.

Renewal Programme: To establish a renewal programme there is a need to undertake specific inspections of the worst channels as identified by the annual RAMM condition rating. The economics of renewing these lengths should then be reviewed and the renewals programmed appropriately. Renewal of kerb and channel is justified when more than 30% of the length of the channel is broken or damaged beyond practical, repair or there is extensive damage to the adjacent carriageway.

There is also a need to validate existing construction date data to enable renewal forecasting. Under the current NZTA criteria, renewals can only generally be considered for funding if the condition of the kerb and channel is contributing to the deterioration of the adjoining pavement formations and the work will reduce future maintenance costs. On these bases there currently are few renewals that can be justified for funding.

A renewal programme is to be developed as described above and is an identified task in the in improvement Plan. An element of this task is to maximise any potential to fund renewals through the subsidised Land Transport Programme using NZTA Work Category 213 – Drainage Renewals.

Renewal Plans: Current condition rating data shows that 77m of kerb and channel is due for replacement as it is in very poor condition. As this length is represented as a percentage of broken channel per length surveyed the actual length that is replaced may vary due to site specific requirements. For example, if it is more sensible to replace an adjoining length in poor condition or to extend the replaced length for growth or aesthetic reasons.

Asset Condition: The extent of deterioration of kerb and channel depends on age, method of construction, the quality of materials and location (damage can be caused by heavy traffic driving over kerb, tree roots etc). The main factor causing deterioration is age, with the bottom of the channel failing (in particular in the older dish channels), allowing water to soak into the sub-grade and the adjacent Base-course of the pavement.

Physical inspections of sealed carriageways are undertaken at regular intervals and a rating system is used to quantify defects, including kerb and channel defects. Using this system, an indication of the general condition of the surface water channel is assessed from rating data using the fault "broken channel".

Each surface water channel is given a condition rating based on the percentage of the channel length that is broken, as detailed in the following table. The condition rating is based on selected fundamental fault types; it does not take account of other defects such as cracking, spalling of concrete and poor vehicle crossings that can detract from the level of service.

Score/Rating	*Condition Description*	*% of Length Broken Channel (m)*
1	Excellent	<5
2	Good	>=5 and <10
3	Average	>=10 and <20
4	Poor	>=20 and <30
5	Very Poor	>=30

Kerb and channel in excellent condition cannot be shown as there is no value recorded if no defect is present, therefore if no defect recorded it is assumed that the condition is excellent.

Defects found during a recent sealed road condition rating survey summarise the length of defects found totalling 1.6km; approximately 1% of all kerb and channel assets.

Overall, 86% of kerb and channel is in average or better condition. This is expected as most was constructed within the last 40 years to good standards and quality.

Renewal/repair of the assets in very poor condition is needed, followed by renewal of the assets in poor condition as their condition deteriorates.

Expected Condition: Expected condition is based on condition ratings, as the overall percentage of faults found is just over 1% of the entire length of the asset, the assumption that kerb and channel assets are in very good condition can be made with confidence.

To forecast expected condition accurate construction dates are required, as this information is not currently available these forecasts cannot be made.

Asset Performance: for kerb and channel assets relate to:

- The profile of the channel; older dish channels have more capacity but are more prone to disintegration and blockage
- Variable performance caused by different and substandard vehicle crossings on older styles, e.g., blockages and breakages
- The integrity of the channel, which is dependent on standard and quality of construction. Older types are more likely to be substandard
- The effects of impact damage associated with vehicles at entranceways, and heavy vehicles elsewhere
- Poor gradient or other alignment problems
- Blockages from debris build up
- The adequacy of supporting stormwater collection and disposal systems, e.g., sumps and pipe reticulation

A more proactive approach to identifying and replacing sections of substandard kerb and channel is needed. Substandard sections need to be accessed for repair or reconstruction, together with footpath rehabilitation works, to complement adjoining work. Kerb and channel condition and footpath condition are major factors in the consideration of street upgrade projects.

Renewal of both of these assets is considered complementary work, and there are practical and economic advantages in renewing both at the same time and in conjunction with street upgrading works whenever it is reasonable to do so.

Expected Lives: When new kerb and channel is constructed, the associated RAMM record is assigned a default service life of 80 years. Condition is monitored regularly with renewals and maintenance work based on condition rather than age.

Older assets do not have accurate construction dates so forecast based on age is not possible. An item has been added to the improvement plan to estimate construction dates for older assets based on other known construction dates for assets in the same area.

New Kerb and Channel

New sections of kerb and channel are acquired when:

- New sections of kerb and channel are constructed in townships by the Council where there was no kerb and channel previously (kerb and channel extension)
- New kerb and channel constructed by the Council as part of rural intersection improvements (quadrant kerbing)
- New kerb and channel is vested in the Council after it has been constructed in new subdivisions by private developers

Development Strategy: Criteria used for justifying new kerb and channel include:

- Evidence of ponding/flooding
- Incompatibility with agreed urban standards
- High cost of maintaining existing stormwater control
- The need for carriageway edge definition and/or separation of footpath/pedestrian areas from a carriageway

Priorities are allocated following evaluation of pedestrian usage, safety issues, stormwater control needs and the number of residential properties to be served. However, Township Committees play a significant role in determining relative priorities when township improvement projects are considered.

New kerb and channel extension can be combined with new footpath extension, and associated berm improvements, to provide an integrated and comprehensive upgrade to a section of berm. This type of work mostly comes about where roading upgrade contributions have been applied on consented subdivision developments.

Development Programme: The timing of new subdivisions, and the amount of kerb and channel that is constructed in them, is dictated by respective private property developers and is strongly influenced by market forces. This work is not funded by Council unless a roading upgrade contribution has been sought as part of a consented subdivision or a Council activity or project eventuates from the consent.

Apart from those works associated with street upgrades, other opportunities to provide new kerb and channel include improvements to the carriageway such as seal widening in urban areas, area wide pavement rehabilitation projects and as part of subdivision commitments.

4.3.8 Deep and shallow surface water channels

Lifecycle Management | An Overview

The primary purpose of all surface water channels is to provide a path for stormwater runoff from the carriageway, footpaths, berms, and sometimes the adjacent properties, to:

- Protect the pavement from water ingress, and consequent structural deterioration
- To allow the convenient and safe movement of pedestrian and vehicular traffic

Deep and shallow channels are generally unlined except in very exceptional circumstances where there is a requirement to prevent sub-surface water infiltration/ exfiltration or erosion of the channel.

The Council's RAMM database records information on shallow and deep surface water channels. The information is stored in the same database table as for other surface water assets, but they are identified separately as they have differing attributes, maintenance requirements and valuation methodology.

Shallow surface water channels are shallow trafficable depressions formed with the invert 2.0m to 3.0m from the carriageway edge and 150mm to 300mm below the edge of the carriageway. Their sides are tapered back to the existing berm with a target slope of around 1:10. These types of channels are referred to as swales.

Deep surface water channels are often referred to as drains. Both types of surface water channel are predominately found in rural areas with the use of swales and drains being common in the outlying urban settlements.

Land drains are part of a wider public drainage network. Their primary function is to drain private land and to convey drainage water and stormwater to receiving water bodies. The proportion of stormwater originating from roads and ending up in land drains is very low.

Operations and Maintenance Plan: Maintaining surface water channels is an important part of rural road maintenance, poor surface water drainage can contribute to premature pavement failure and ponding of excess water can cause safety hazards. All maintenance on earthen surface water channels is carried out under the Road Maintenance as part of sealed and unsealed roads maintenance work.

Condition Inspections: The Council's engineering staff and the road maintenance contractor report any defects observed in day-to-day road maintenance activity. RAMM rating surveys on sealed roads record whether high shoulders are present, which provides a good indication of the current effectiveness of the corresponding surface drainage systems.

Unplanned Maintenance: The road contractor is required to maintain an effective communication system and level of preparedness to ensure emergency works are undertaken as soon as possible after notification.

Planned Maintenance: Damaged and malfunctioning assets identified by MDC staff, contractor reports or the public are programmed for repair according to the following criteria:

- Public safety
- Accelerated deterioration of the adjacent pavement is occurring, or is likely to occur
- Inconvenience occurring to road users, pedestrians and/or property owners
- Untidy appearance
- Optimisation of complementary work scheduling

Shallow SWC | Swales

To address the performance issues, high shoulders on the carriageway sides of swales are periodically removed. This is done on a cyclic basis in conjunction with pre-reseal repairs on sealed roads and remetalling, grading and other pavement renewal works on unsealed roads. The swales themselves are also reformed and improved as part of this complementary work.

Currently high shoulder removal work and swale reformation is classified as maintenance. However, because of its longer-term cyclic nature it can also be considered a renewal.

Deep SWC | Drains

Adequate maintenance will keep these channels functioning indefinitely. They are cleaned by mechanical excavation when the build-up of detritus is sufficient to impair their performance. Some drains are also sprayed to control vegetation, especially woody type weeds.

Cut-Outs

Cut outs are channels cut through sections of high shoulder to allow water to drain off the carriageway. These are in place on sections of road that require shoulder removal but have not yet had the work approved but are usually on unsealed roads. The cut outs should be shaped so that vehicles are able to drive through them if necessary. This is usually done by the grader while maintenance grading in the area.

Operational and Maintenance Processes

Maintenance Forecast: The maintenance of unlined surface water channels is budgeted under NZTA Work Category 113 - Routine Drainage Maintenance in the Council's Land Transport Programme

Deferred Maintenance: The impact of deferred maintenance is accelerated deterioration of unlined surface water channels and the adjacent pavements, with a corresponding lower level of service with respect to ride and stormwater control. It can also be a safety issue if water is sufficiently widespread and deep to cause vehicles to aquaplane and lose control.

Condition, Performance and Capacity

Shallow SWC | Swales

Swales generally maintain their shapes reasonably well. However, there is a gradual deterioration over time because of the build-up of vegetation, soil, and sometimes road metal, along the edge of the carriageway causing "High Shoulders". This occurs on both rural sealed and unsealed roads but is more rapid on the latter where it is exacerbated by normal maintenance grading.

The effect of grading is to build up the edge of the berm, which then retains a proportion of the stormwater on the road surface for longer than would otherwise occur. This allows a greater opportunity for water to seep into the pavements' structural layers, and on metal roads it combines with passing traffic to develop large potholes rapidly.

Vegetation in the invert of the swale has little direct effect on a channel's performance. As long as the channel is not clogged, vegetation has a positive effect as it can filter out contaminants and improve water quality before it goes sub surface either naturally or via soak holes.

Based on knowledge and condition assessment, the current condition of swales is that:

- They are generally in good condition where recently formed

- High shoulders are present, to varying extents where seals are in the last part of their lifecycle(s) or where they were not removed before the last reseal
- On metal roads

Deep SWC | Drains

Deep drains within the road reserve can serve one of the following functions. They can be:

- Road Drains, built to carry large volumes of water running off the road or to protect the road from high ground-water levels
- Land Drains, draining adjacent land but not serving any additional road function
- Shared Drains, as the name implies the benefits are shared between the property owner and the road. Maintenance is a matter of negotiation

Drains generally deteriorate slowly. The major issue they face is slow accumulation of sediment as material is precipitated from stormwater and loss of capacity through growth of vegetation. Both of these problems are controlled by routine maintenance. Based on knowledge the current condition of drains as they may affect the roading asset, they are generally in good condition, with no known recurring problems caused by inadequate maintenance.

Asset Performance Data: Performance issues for swales and similar earthen surface water channel assets relate to:

- The effects of impact damage associated with vehicles at entranceways
- Substandard culverts, built with or without the proper authority from the Council
- Blockages from debris build up
- The adequacy of the receiving stormwater collection and disposal systems, e.g., soak holes, culverts, drains and streams

Renewals Plans

There is currently no renewal plan for swales and drains as this has been considered as a maintenance activity.

New Unlined SWC

There is no current requirement for new road drains (deep SWCs). New swales are formed if the adjacent section of rural carriageway:

- Is showing deterioration from ingress of water to the pavement structure
- Is subject to ponding caused by the inability of stormwater to flow off the surface onto the adjacent berm
- Is scoured by stormwater
- Has high shoulders removed

Otherwise, they are provided as part of cyclic maintenance work in advance of reseals and unsealed road re-metalling and pavement during renewal work.

Development Strategy

Priorities are allocated following consideration of costs, effects on pavement life, other programmed works, safety issues, and stormwater control needs. Because the work is so intimately bound with other maintenance activities, it has traditionally been regarded as a maintenance activity.

Development Standards: The location of new swales in the carriageway cross section is determined largely by the road's hierarchy and the associated width standards.

The procedure employed where the existing roadside is maintained to a high standard by the adjacent property owner, is to reinstate the trimmed area to a condition that allows it to be mown to the previous standard once vegetation re-establishes. Rural roadsides are not re-sown with grass after high shoulder removal. However, the removal of high shoulders and the formation of any swales in these situations still needs to accomplish a continuous well-draining profile to ensure good drainage along the whole section of the road.

Roadside berms, when disturbed by roading activities are generally left in a condition that allows mowing with a tractor mounted mower.

Development Programme: The timing of new rural subdivisions, and thus the swales they contain, is under control of the respective property developers and is strongly influenced by market forces. This work is not funded by the Council and is not programmed in this, or any other Council plan.

4.3.9 Features

Overview of Assets

Features are generally structures which have been installed in the road reserve to enhance the aesthetic appeal of the area. An example is stone features installed by developers at the entrance to subdivisions. Once the subdivisions are vested to Council, ownership these assets fall under its control, and they form part of the transportation asset base.

There is little requirement for ongoing management of features assets. The following table summarises the information held for Features:

Feature	*Total Features*
Fence - Hardwood and Wrought Iron	2
Stone Wall Feature at Entrance - Large	5
Stone Wall Feature at Entrance - Small	4
Tree Planter (CBD)	4

4.3.10 Footpaths

The majority of footpaths are constructed of concrete, other materials include asphalt, paving stones, chip seal and metal.

Service Delivery and Rationale

The maintenance contract includes all footpath maintenance work including safety repairs or other minor ordered repairs as required. Ordered work includes:

- Pothole repair
- Replacing footpath battens
- Grass edge trimming
- Weed control
- Cleaning (removal of moss/lichen)

- Repair of surface defects prior to footpath resurfacing
- Filling depressions and slumps, and the reinstatement of utility trenches

Fault information is gathered for each section of footpath with the number of faults recorded in the RAMM database.

The following fault categories are used:

- Settlement
- Bumps
- Depressions
- Crack
- Scabbing
- Pothole

NZTA Work Category

Footpaths are managed under NZTA Work Category 125 for Maintenance and Renewal activities.

Maintenance Strategy

Maintenance needs are mainly identified during contractor and MDC staff inspections. Other sources are also used, such as RAMM rating surveys, public and community committee requests.

The consequences of inadequate maintenance are:

- Reduced safety
- Accelerated footpath deterioration and additional consequential costs; and/ or
- Lower level of service (ease of use, appearance)

Footpath maintenance is prioritised using the following criteria:

- Available budget
- Optimisation of complimentary work scheduling
- Safety of pedestrians
- State of surface affects ease of use e.g., rough surface, potholes
- Likelihood that the area of distress may expand and require more expensive intervention
- Aesthetics (e.g., minor water ponding/untidy appearance)

Maintenance Plans

Once faults are identified they are included in work programmes. The amount of work carried out on footpath maintenance is based on physical need and the Council's approved budgets. The quantity of work carried out is based on prioritising the worse sections and working within the available annual budgets.

Renewal/Replacement Plan

Renewals are carried out to:

- Return paths to their original condition
- Provide for safe passage and ease of use for pedestrians, as appropriate to the facility
- Provide a surface that requires minimal lifecycle maintenance.

Renewal is required when a path has deteriorated to the extent that:

- The required level of service is not being delivered
- Continued maintenance is not economical

Justification of renewal work is also influenced by:

- The condition of the kerb and channel adjoining the footpath - Replacement of substandard kerb and channel will also require the reinstatement of the footpath, generally to an extent consistent with full reconstruction
- The advantages of co-ordinating with other nearby works, such as street upgrading, urban road reconstruction or renewal of other utility services

The types of renewal work undertaken to renew these facilities include:

- Resurfacing, where the existing formation is sound, to provide a smooth, waterproof, surface by:
  - Overlaying with asphaltic concrete on existing surface
  - Resealing with bitumen and chip or slurry on existing chip seal
  - Resurfacing with asphaltic concrete on existing chip seal
  - Removing the existing surface and laying new surface over existing Base-course
  - Reconstructing substandard sections of path, where the existing formation is unsound, by replacing any timber battens, Base-course and surfacing

Work needs are identified following identification of work. Priorities are based on:

- Level of service deficiencies/path performance, including safety issues – differential settlement, cracks, potholes etc
- Physical condition
- Co-ordination with other works, such as kerb and channel replacement, installation of underground wiring by utility companies, underground utility renewal, and street upgrading
- Likelihood of accelerated deterioration

Asset Condition: The extent of deterioration of footpaths depend on age, method of construction, the quality of materials and location (damage can be caused by heavy traffic driving over paths, tree roots etc). The main factor causing deterioration is age, with the path exhibiting failure through cracking and displacement.

Physical inspections of footpaths are undertaken at regular intervals and a rating system is used to quantify defects. Each footpath is given a condition rating from 1 to 5 (Excellent to Very Poor).

Defects found during the most recent rating survey summarise the length of defects found totalling 1.6km; approximately 1% of all footpath assets.

Overall, 97% of footpaths are assessed as average or better condition.

Asset Capacity: Expansion of the footpath network requires a deeper understanding of pedestrian movement according to how the towns are changing according to how people are using retail areas, businesses and community services.

As the extent of the asset increases and other influences change with time, it is likely that it will be necessary to revise the current approach to prioritising this work. In particular, a combination of the present system inspections and the use of rating data collected for RAMM on footpaths is more likely to indicate the expected condition of footpaths. It will provide a better indication of the need to increase expenditure on maintenance and renewals.

Renewal Standards: Renewal works comply with the standards for new works as detailed in Council's standard specification for footpath construction.

Generally, sections of footpath are renewed on a like for like basis, however consideration is given to change the type of material used if the change will better suit the site.

Renewal Programme: The required level of renewal varies depending on the:

- Levels of service provided by the paths
- Condition profile of footpaths
- Age profile of paths
- Proximity of trees
- Level of on-going maintenance required
- Economic lives of the materials used
- Effects of underground wiring

Renewal Forecast: To enable long term renewal forecasting an accurate construction date is required. This information has been incomplete in the past; to address this, Council has conducted an assessment of its assets and determined actual (or likely) time of construction. These findings have been implemented into Council's RAMM database and now provides a baseline for an initial renewal forecast. This data now needs to be aligned with condition (past and current) to confirm expected useful lives of Council's varying footpath types.

Forecast Footpath Surface Condition: The data collected for RAMM on footpaths details the condition of footpaths and indicates any likely need to increase expenditure on renewals/maintenance. Ideally, this should be used in conjunction with annual inspections when prioritising work based on budget allocations for maintenance work.

Asset improvement and Development Plan

Council's Walking & Cycling Strategy is the most significant driver of new footpath and cycleway improvement projects.

In general, other new paths are acquired through:

- New paths being constructed by Council where no path previously existed
- New footpaths vested to council in new subdivisions

Development Strategy: The footpath and cycleway/pathway development strategy is to:

- Carry out the projects and other activities required to implement Council's Walking & Cycling Strategy
- Develop other new footpaths where there is a clear community need and strong community support for them
- Provide footpaths and cycleway linkages that have been identified through Council initiatives, such as township structure plans, neighbourhood accessibility plans and in planning for new urban subdivisions
- Promote and encourage third party initiatives to establish formed walking and cycling pathways for both commuter and recreational purposes
- Ensure opportunities are taken to establish walking and cycling facilities when upgrading existing or planning new roading infrastructure projects

The criteria used for advancing and prioritising footpath and cycleway development projects are:

- Achievement of Council's Walking & Cycling Strategy's goals and objectives
- Pedestrian and cyclist safety
- The locality, proximity and suitability of alternative paths
- The vehicle operating speed on adjacent carriageways
- Providing and enhancing connectivity e.g., between new urban subdivisions
- Township and Community Board committee priorities (within their jurisdictions only)
- The ability to co-ordinate with other works to provide a package of complementary works to meet demand e.g., roads, walking, cycling, public transport etc
- Promotion of sustainable transport options

Development Programme: The timing of new subdivisions and thus, the paths they contain, is under control of the respective property developers and is strongly influenced by market forces. This work is not funded by the Council and is not programmed in this, or any other, Council plan. Where possible, funding for projects will be sought through the NZTA subsidised Work Categories 451 and 452, Pedestrian Facilities and Cycle (Shared Path) Facilities respectively. The funding eligibility criteria generally excludes projects that are purely for recreational purposes, and those that have no other benefits such as the promotion of sustainable transport options. As another of the criteria for eligibility, projects should achieve an economic benefit cost ratio of 1 or above.

Other supporting education, promotion and enforcement aspects associated with the Strategy are funded in other work categories, primarily Work Category 432: Safety promotion, education and advertising.

Management Programme Maintenance Standards: Technical and materials standards are generally those specified for on-carriageway works. However, care is required to avoid making new tripping hazards, to avoid creating nuisances caused by "wet tar" that can track into shops and homes, and avoidance of loose chip on footpaths and cycleways with smooth surfaces such as concrete or asphaltic concrete.

Deferred Maintenance: There is no intentionally deferred maintenance; once the improvement task of better utilising condition rating data is achieved, maintenance may be deferred based on priority and available budget.

4.3.11 Islands

Overview of Assets

Traffic Islands are painted areas or raised concrete delineation devices, generally at intersection or in the centre of wide carriageways. Islands can be painted directly onto the road surface or can be constructed of entirely of concrete, concrete edged pavers or concrete edged landscaped areas.

If the island uses painted road markings only, without raised kerbs or other physical obstructions, it is called a painted island. When traffic islands are painted for longer lengths, they are referred to as traffic medians, shown as a strip in the middle of a road acting as a divider between lanes over a much longer distance. When making a right turn out of a junction, drivers will often drive into painted median refuge and wait for space before entering traffic, as a way of crossing one lane of traffic at a time. Some traffic islands may also serve as refuge islands for pedestrians wishing to cross a road or State Highway.

Painted Islands are managed and recorded along with other Painted Road Markings.

Areas of grass and gardens inside some Islands are maintained by the Council's Parks and Property contractor.

Service Delivery and Rationale

Islands have reflective white painted surfaces on the boarders, for safety considerations these surfaces need to be repainted on a regular basis so are included in the annual Pavement Marking Contract which encompasses all Pavement Markings throughout the district.

Painted Islands are renewed on an annual cycle along with their Painted Road Markings.

The condition of traffic islands are assessed during routine inspections undertaken by the Contractor, with the results reported to Council. There is no formal condition rating system for this traffic services assets; condition is assessed both visually, and in accordance with the appropriate key performance indicators.

NZTA Work Category

Islands are included in the Traffic Services group and are managed under NZTA Work Categories 122 for Maintenance and 222 for Renewal activities.

4.3.12 Markings

Painted pavement markings are provided consistently throughout the district to identify road features, hazards and to provide general information to road users as follows:

- Road markings
- Road centre lines, lane lines, no overtaking lines/no passing lines
- Edge lines and shoulder markings
- Median markings, cycle lanes, parking areas
- Traffic Islands, intersection markings
- Messages and symbols
- Pedestrian crossings
- Railway level crossings
- Fire hydrants
- Raised reflective pavement markers (RRPM)
- Audio Tactile Pavement Markings

Overview of Assets

Basic detail on Road Markings is held in the RAMM database. However, as the annual road marking work is tendered separately from other maintenance work it is more efficient for contractors and MDC staff to manage using a spreadsheet rather than the RAMM database. The RAMM database is updated periodically from the spreadsheet, so detail of any additions are captured.

Service Delivery and Rationale

Painted pavement markings are remarked annually with this task being treated as a renewal item. The use of a separate contract reflects this asset's more specialised needs in terms of plant, materials and required operator skills.

The key issues relating to markings are:

- The quality of road marking materials and application
- Establishing relevant customer levels of service for road markings

- Establishing economic and meaningful performance measures for signs and markings
- Problems with markings adhering to fouled surfaces
- Maintaining road markings in areas of high wear
- Providing a consistent appropriate standard of road marking on all roads in the district, relative to their hierarchy and use

NZTA Work Category

Islands are included in the Traffic Services group and are managed under NZTA Work Categories 122 for Maintenance and 222 for Renewal activities.

Strategy

Maintenance needs are identified through inspections of the roading network by the contractor and Council staff. Maintenance activities are also carried out as a result of other pavement maintenance operations, for example road marking following surface patching after a pavement repair.

Operational and Maintenance Processes

The majority of this work is carried out under a separate renewals contract. However, the maintenance contract does specify in several of the pavement repair sections that the contractor is responsible to reinstate any required pavement marking.

Renewal/Replacement Plans

Repainting of all marking is carried out on a cyclic basis over a 12 month period using the NZTA P/12 method based specification. This work is treated as renewals with the asset having a 12 month effective life.

The standard of road marking in the performance specification is based on five criteria:

- Colour (daytime and night-time)
- Daytime Visibility
- Night-time Visibility (dry and wet)
- Skid Resistance
- Durability

The measurement of each of these criteria is set out in the specification, along with the values to be achieved. The contractor is required to carry out regular inspections and measurements to ensure that the road marking meets the standard set in the specification. If it does not meet the standard, then the marking is repainted. The reinstatement of road markings after reseals and reconstructions is carried out as part of the resealing contract.

4.3.13 Railings

Overview of Assets

Rails that provide roadside site visibility and safety protection. There are two different types, sight-rail and guardrail:

- White timber posts and boards, used as visual aids
- Lightweight steel Armco barriers, used as physical barriers

A sight-rail is one or more timber boards, secured by posts driven into the ground, positioned approximately 500mm – 1,000mm above the ground, most commonly along the edge of a carriageway bend. They act as a visual aid to road users defining the edge of carriageway around an approaching bend or a section of road with limited shoulder width. As with road line marking, sight-rails are also painted white.

Unlike a guardrail barrier system sight-rails have no real structural ability, and the posts will only provide a minimum amount of restraint under a vehicle collision.

The condition of sight-rails are assessed during routine inspections undertaken by the Contractor, with the results reported to Council. There is no formal condition rating system for this traffic services assets; condition is assessed both visually, and in accordance with the appropriate key performance indicators.

Sight-rails are also routinely inspected to ensure cleanliness, clarity and damage. Sight-rails are routinely painted by the contractor and reported accordingly. Occasionally, repair work may be required due to a road traffic collision which may include replacement of timber boards or posts.

A guardrail is a lightweight steel barrier system built along the edge of a carriageway to act as a vehicle restraint. They are generally selected for construction in areas with a greater risk of an incident occurring, such as a bend with a significant speed reduction or steep drop.

If a vehicle travelling around the bend loses control for any reason, crosses the edge of carriageway and strikes the barrier, the steel will deflect, and the vehicle impact energy is dissipated. As a result, the vehicle will be pushed back towards the road, which greatly reduces occupant risk. The lightweight posts used are designed to provide a forgiving impact and minimise vehicle damage where possible. Guardrail installations have differing types of end terminal systems which are designed to minimise damage and subsequent injury from impact with the start or end of the guardrail. Some terminal systems are designed to collapse on impact while others are designed to deflect the vehicle.

Service Delivery and Rationale

The routine maintenance involved with crash barrier systems is minimal for the contractor however, renewal work can be very time consuming and expensive. The guardrail barrier sections are designed to act as a single system, therefore damage to one section can mean several sections actually need to be replaced in order for the barrier to function correctly.

NZTA Work Category

Islands are included in the Traffic Services group and are managed under NZTA Work Categories 122 for Maintenance and 222 for Renewal activities.

4.3.14 Retaining walls

Overview of Assets

The purpose of a retaining wall is:

- To provide structural support and lateral restraint to the carriageway
- To provide structural support to land adjacent/above the carriageway, preventing material slipping down and blocking the drainage channel or road

If the land directly above a road carriageway collapses due to bad weather or a serious weather event, the slip material is cleared away and the adjacent bank reshaped at an appropriate gradient to prevent further collapse. This is known as a road retreat. In certain circumstances, such as a confined road width on a hillside, a retreat is not possible, and a retaining wall may be constructed to either prevent material from further collapse or support the roads from collapsing to a lower level. This is more common in the northern parts of the district where the terrain is often unstable and susceptible to land slips.

Emergency response and reinstatement work such as this is normally managed separately as it qualifies for a higher subsidy rate than general maintenance. Most retaining wall installations form part of an emergency reinstatement programme created after a serious weather event.

Construction of a new retaining wall follows the following process:

- Identification of the site | normally from inspection by council staff or the maintenance contractor
- Design | this usually involves appointment of a structural engineer and sometimes geo technical reports on land stability
- Compliance | resource consent applications are lodged if required
- Tender | following a weather event where multiple walls are required, council will release tenders for individual sites or bundled work as is seen fit at the time. Contracts for individual or smaller value walls may be given to preferred contractors by direct appointment
- Construction | contractors are supervised by MDC staff during the construction phase

The Council holds data for retaining walls. Differing methods of design and construction are adopted for new retaining walls depending on the requirements for the site.

Information held for retaining walls dates back to 1990; there are retaining walls that were installed before this time, but Council does not hold any data for these assets. Existing retaining walls, constructed before accurate activity management was adopted, become increasing difficult to identify and maintain due to vegetation growth and further minor land slippage. MDC plans to validate existing data and as part of this process, some older retaining walls may be discovered. However, due to the difficulties in locating old sites this is not a specific task identified in the improvement plan.

Key issues relating to retaining walls are:

- Carriageway drainage | poor drainage is a major factor in destabilisation of the land supporting the carriageway, or the land above the carriageway
- Emergency response | generally when a severe weather event occurs there are many sites where new retaining walls are required, this involves a coordinated approach for emergency and long-term reinstatement
- Construction time | new walls need to be designed by structural engineers and the time between the need arising and a new wall being completed can be lengthy. Temporary reinstatement can be costly and disruptive to road users
- Resource consent | often retaining walls are required in riverbeds and their installation can affect waterways. Resource consent requirements and applications can cause further delays to construction
- Maintenance of unknown walls | old walls can be difficult to locate when no data is held, as these walls are not included in any inspection programme, their maintenance or renewal requirements are unknown
- Unstable terrain | the nature of the terrain in the northern part of the district causes an ongoing need for walls in some areas

Occasionally a new retaining wall needs to be built on land outside the council owned road reserve. Generally, landowners are cooperative and allow the construction, however, land can be acquired under the Public Works Act 1981.

Operations and Maintenance Plan

Once retaining walls are established, they generally require little maintenance. As retaining walls are constructed to stabilise land, the nature of the stability of land surrounding them is inherently poor. Therefore, visual inspections are occasionally carried out by the road maintenance contractor however, a more thorough inspection may be performed by a road engineer if any subsidence or movement is noted.

Currently there is no specific inspection regime in place, however, the maintenance contractor inspects the entire network regularly and this identifies any retaining wall failures. If any significant structural maintenance is required, this will be tendered to and undertaken by, a contractor who specialises in structural repair work.

The road maintenance contractor is required to undertake regular inspections of the entire road network. Slips and dropout sites (where the land supporting the carriageway slips away) are identified from these inspections.

After assessment, reinstatement of a site identified from these inspections may require design and construction a new retaining wall.

NZTA Work Category

Retaining Walls are included in the Structures group and are maintained under NZTA Work Categories 114 for Maintenance and 215 for Renewal activities.

Strategy

Maintenance needs are normally identified by contractor inspections or by MDC staff who actively monitor performance of existing retaining walls during their own network inspections.

Retaining wall maintenance is tied closely to drainage maintenance, as poor drainage contributes to erosion and undermining of the carriageway structure. Drainage requirements are assessed for each retaining wall during the design phase, and this must be monitored to ensure further damage does not occur. Good drainage can prevent slips and dropouts and the need for reinstatement with retaining walls.

Emergency Response

During a severe weather event, Council staff monitor rainfall and rising river levels, particularly in the northern catchment areas and tributaries of the Ōroua River and the Makino Stream. The road engineers will accompany the maintenance contractor on a thorough inspection of the entire road network during and after these events. This will ensure any sections of road that have become blocked, due to the ground material directly adjacent to the carriageway slipping onto the carriageway, are identified and cleared as quickly as is practicable.

Renewal/Replacement Plan

No replacements are anticipated based on current knowledge.

Asset Condition: As noted previously, no information is recorded in RAMM for retaining walls prior to 1990. The condition of the recorded retaining walls is very good; however, the accuracy of this information may be subject to scrutiny and not a completely clear representation of the entire asset base due to the possible condition of unrecorded retaining walls. Visual inspections of the road network are carried out with the intention of locating and recording any existing retaining walls within the road network, not currently entered into RAMM.

Asset Capacity/Performance Data: When considering the selection of design for a retaining wall, an assessment and evaluation must be made by the engineer to determine the wall is fully functional but not excessively costly.

Generally, as the ability of the retaining wall increases, the price will increase accordingly. The chart above shows that 90% of the retaining walls currently monitored are in either an excellent or a good condition. This clearly demonstrates that when considering the current asset capacity and performance, their design criteria was completely adequate, and the assets are fully capable of withstanding the necessary loading from road traffic.

Renewal Standards: Renewal work is extremely unlikely with retaining walls, as a loading safety factor is incorporated into the design process to ensure the wall will act correctly even under conditions more extreme than it was originally envisioned.

In the unlikely event that a wall begins to develop a horizontal movement, a full inspection of the wall will be carried out to determine if movement or failure is occurring. The inspection may conclude that movement or minor damage is within acceptable limits and further monitoring is required. If not, an individual component or member can be selected for replacement by a specialist contractor.

Expected Lives: All retaining walls, regardless of construction method or material, have a default useful life of 80 years. This default life is used for forecasting, valuation and depreciation purposes. In reality, once a retaining wall has stood the test of time it is unlikely to be replaced unless there is further land movement at the location, or other works dictate its replacement.

Renewal Plans: There are currently no renewal plans in place.

Upgrade Process: Retaining walls are upgraded for the following reasons:

- As part of an area wide pavement rehabilitation or seal widening projects
- Most retaining walls in the district are located in the northern part of the district in areas with low growth, so upgrade of retaining walls for this reason is rare
- Further slippage or subsidence of land occurs
- This could be as a result of a previous “do minimum” option, an under designed retaining wall or failure of drainage systems

4.3.15 Shoulders

Overview of Assets

The shoulder is the trafficable surface between the edge of seal and the feather edge of the carriageway. Shoulder data applies to rural areas only. Generally, shoulders are unsealed.

Operations and Maintenance Plan

Shoulder Maintenance and Renewal work is generally undertaken in conjunction with other work on the adjacent Drainage Channels or Road Pavement. Complementing work activities include:

- Pavement Rehabilitation
- Surface Resealing
- Re-Metalling and Shape Correction (unsealed roads)

- Drainage Channel maintenance or renewal
- Sealed Pavement Maintenance (e.g., edge break repairs or pre-reseal repairs)

NZTA Work Category

Shoulder maintenance and renewal is generally included with the parent activity Work Category

4.3.16 Signs

Overview of Assets

The purpose of road signage is to contribute significantly to a safer road network. The use and design of signage is controlled by statute. The current statutory regulation controlling them is Land Transport Rule: Traffic Control Devices 2004, Rule 54002/7.

Most of the signs used New Zealand roads are based on international symbolic signs. Symbolic signs are used because they are quick to read and easy for all drivers to understand. Road signs are generally made of reflective material, making them easier to read at night.

The key issues relating to signs are:

- Providing a consistent appropriate standard of signage on all roads in the district, relative to hierarchy and use; and
- Damage caused to signs by vandalism and traffic accidents

Road signs are installed across the district in a consistent manner with the following main purposes:

- To summarise regulatory instructions that road users are required to obey e.g., speed limits and controls at intersections:
- Chevrons to indicate abrupt changes in road direction
- Warning of temporary or permanent hazards that may not be self-evident
- Indicating directions and distances to destinations
- Indicating road user services and tourist features/establishments
- Indicating other information of general interest to road users

Signs are recorded with posts as components of the parent sign, a single sign an have multiple posts but can also share a post with other signs in cases where multiple signs are installed on the same post.

Operations and Maintenance Plan

Maintenance and inspection duties for the Traffic Services assets described in this section are carried out under the Road Maintenance Contract. On this basis, the service delivery and renewal/replacement sections normally expected for a sub asset have been combined in this instance.

The Maintenance Contract specifies:

- Minimum maintenance standards
- Frequency of routine inspections
- Response times to correct defects

NZTA Work Category

Signs are included in the Traffic Services group and are managed under NZTA Work Categories 122 for Maintenance and 222 for Renewal activities.

Operational and Maintenance Processes: The Contractor is required to maintain an effective level of preparedness including temporary traffic signs to ensure emergency signage works can be undertaken to comply with the levels of service stated in the maintenance contract.

The scope of routine works within the road maintenance contract has separate requirements for the different asset groups described in this section.

Council carries out monthly audits to ensure the contractor is correctly carrying out their routine works. The request for service system is used by the public to report a problem with a road sign, which is directly sent to the maintenance contractor.

Signs deteriorate through weathering, which causes both loss of reflectivity and fading of sign colours. However, most signs are replaced because of damage resulting from vandalism and vehicle accidents.

Warning, regulatory and information signs are generally in good condition because the majority of the signs are relatively new because of previous upgrade programmes. The large number of new signs that eventuated came about because of the lack of signs prior to this and because of the replacement of non-conforming or substandard existing signs.

Under the maintenance contract, the contractor is required to carry out a detailed condition rating and inspection on Council road signs.

Renewal/Replacement Plan

Since 2014, MDC has undertaken periodic Traffic Safety Reviews of a number of high use rural roads. The reviews identified a number of deficiencies and recommended areas for improvement to bring the standard of signage and delineation to the level of current standards. The recommendations are being progressively implemented.

All new signs are installed or painted in accordance with MoTSaM, which in turn, complies with the requirements of the Traffic Control Devices Rule.

Asset Performance Data: Performance issues for signs relate to coverage, accuracy of placement, visibility, reflectivity and conformity with standards.

Upgrading of the asset over time has reflected the importance placed on road safety and the higher levels of service expected by the travelling public.

Obsolete, damaged, sub-standard and non-conforming traffic signs assets identified during inspections are programmed for replacement subject to funding provisions in the following priority order:

- Public safety
- Traffic volumes
- Convenience of road users

Deferred Maintenance and Renewals: The impacts of deferred maintenance and renewals may lead to loss of legibility/definition of the sign or marking. In the case of missing or removed signs, information provided by the road sign is not provided. All of these circumstances lead to a decrease in the levels of safety provided by the network.

There are no deferred maintenance or renewal issues at present.

Upgrade Process: New signs are installed to provide information and improve road safety. Problem sites are continually surveyed, and appropriate signage installed, with priorities being broadly assigned in accordance with the roads' hierarchies and traffic volumes.

New signs and markings are often vested in the Council from new urban subdivisions undertaken by private developers.

4.3.17 Streetlights

Overview of Assets Involved

The purpose of street lighting is to ensure the council's street lighting and amenity installation continues to operate safely, efficiently and effectively over its economic life with minimum failures and outages.

The first streetlights were installed in the district around 60 years ago on a relatively small scale and only in town centres. Since that time, advancements in technology along with increasing ratepayer expectation and implementation of lighting standards has driven continuous improvement and expansion of the asset base.

Streetlights are provided for a variety of reasons, ranging from lighting at specific rural intersections to improve traffic safety, lighting of high traffic volume areas, lighting residential and rural streets and roads and lighting of amenity areas such as pedestrian pathways and parks.

Council manages street light assets located on local roads as well as those located on urban state highways, which are managed under delegated authority from NZTA.

Historically streetlights have been mounted on other utility poles like telecom and electricity network poles. Over the past 40 years new urban subdivisions have utilised underground power and telecommunications services, requiring streetlights to be mounted stand-alone lighting poles. The developers who construct these subdivisions often utilise decorative light fittings and poles to enhance the streetscape. The installations that are then subsequently vested to Council can have higher maintenance and renewal needs and demands. As part of the subdivision approval process the developer must submit the proposed compliant lighting design and gain council approval before installation of the lighting assets to be vested, this gives Council control over the quality and type of assets it will inherit.

The key issues relating to the management of street lighting are:

- Specialist industry, most local authorities have limited in house knowledge forcing reliance on consultants and contractors
- Changing technology means identifying opportunities for optimising street lighting power consumption and maintenance requirements
- Reliance on the electricity network owner to maintain the street lighting power supply cables, network outages impact on council levels of service
- Lighting standards that reflect the intended use and road hierarchy
- The need for a development of a street lighting upgrade and renewal programme
- The impacts of any future overhead wiring undergrounding programmes
- The effect of decorative urban streetlights vested in the Council, by urban subdivision developers, on renewals and maintenance budgets

As the District's communities have become more concerned about personal safety and property protection, there has been an increase in public interest regarding the standard of lighting provided throughout the district.

Council follows NZTA's M30 Specification and AS/NZS 1158 Street Lighting series of standards. These set out recommendations for lighting systems for roads and other outdoor public areas, primarily to provide a safe and comfortable visual environment for both vehicular and pedestrian movement at night.

Urban streetlights installed under the AS/NZS 1158 standard have differing purpose. On higher volume roads, or V Category roads, the road user is the main consideration, and the design is based around lighting the road. On residential streets with lower traffic volume, or P Category roads, there is more emphasis placed on security and pedestrian safety, so lighting the whole road reserve is considered.

The asset base also includes some lighting in reserves and other amenity areas. Although costs for these lights are administered by different council departments the maintenance and management is undertaken under the same contract as for all other MDC street lighting.

Rural lights are primarily for flag lighting at road intersections and other significant locations such as rural halls and schools. In some cases, residents of the smaller more rural townships in the district prefer to have little to no street lighting, which is more in keeping with the rural environment.

Streetlights are componentised to 3 asset sub types these are the pole, bracket and light:

- Pole, this can be a utility network owned pole or a standalone street light pole
- Bracket, the steel arm mounted to the pole to support the luminaire, in the case of steel standalone poles the bracket is an integral part of the pole, but it is still identified as a separate component
- Light, lighting unit which comprises of control gear and lamp. There are two types of light currently in use, High Pressure Sodium (HPS) and Light Emitting Diode (LED). HPS are older technology lights which were used from the 1990's until LED technology became affordable in around 2017. LED streetlights have many advantages over HPS, mainly lower energy

Ownership

Council owns the majority of the dedicated stand-alone street light poles; others are owned by NZTA, and some are some privately owned. Where a streetlight is supported by a utility company's pole or by another other structure not owned by Council, the light and its bracket are included in the asset register, but not the pole or building. However, in these cases the nature of the support and its owner are noted.

Brackets and Luminaires are predominantly owned by Council and NZTA with some privately owned streetlights identified.

Many privately owned streetlights were installed before Council took ownership of the asset base, when consideration of long term maintenance and power costs were not a factor. An example would be a streetlight installed at the end of a private right of way, which may serve only two or three properties. These streetlights are generally connected to the same electrical circuit as Council and NZTA assets, but as they are identified by owner, they are excluded from any Council funded maintenance and energy cost payments.

The street light inventory is maintained in the RAMM database. This allows continual updating of asset information as maintenance and renewals are undertaken and provides accurate information to predict future maintenance and renewal requirements.

Asset ownership is identified in the database so costs associated with NZTA streetlights can be separated, and so owners of other assets which are not maintained by Council, are easily identified.

Operations and Maintenance Plan

The street light maintenance contractor is required to:

- Provide an immediate response to hazards
- Undertake monthly inspections of the entire network at night, to ensure all luminaries are operating, undertake necessary repairs to non-functioning lights
- Develop maintenance programmes from the schedules of defects identified during the inspections
- Monitor asset condition by undertaking planned daytime inspections, action routine maintenance and report on any unexpected maintenance requirements
- Undertake routine shear base pole maintenance to ensure correct security of mounting bolts
- Ensure no lights malfunction continuously and that there are no areas where continual intervention is necessary
- Repair, on demand and within the specified response timeframes, faulty, accident damaged or vandalised lanterns, lamps, control gear, columns (poles) and associated equipment

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

- Public safety (top priority)
- Traffic movement
- Future costs if the work is not done

When street lighting assets are renewed, any components that can be used as spare parts are retained in storage. Other surplus assets generally have no commercial value and are disposed of by the contractor.

NZTA Work Category

Streetlights are included in the Traffic Services group and are managed under NZTA Work Categories 122 for Maintenance and 222 for Renewal activities.

Operational and Maintenance Processes: The maintenance requirements for the MDC streetlight network have greatly reduced since the phasing out of the majority of older technology High Pressure Sodium Streetlights (HPS) which have been replaced with more efficient LED technology. This is discussed in more detail under the Accelerated LED Replacement Programme.

With the reduced need for monthly maintenance MDC has not needed a formal streetlight maintenance contract which has traditionally been in place for periods of up to 5 years.

To undertake the required maintenance MDC engages an approved contractor on an as needed basis for general repairs, scheduled maintenance, inspections and minor renewal work.

Renewal/Replacement Plan

Asset renewal is undertaken when a streetlight or a significant component of a light has reached the end of its economic life. Renewal requires replacement of either the complete installation or individual components of the installation e.g., luminaire, bracket or pole. Renewals are generally programmed to coincide with street upgrades.

Strategy and Funding Mechanism

Renewal Strategy: There are no legislative requirements for manufacturers to supply spare parts for the lanterns beyond any given period. The Council will attempt to account for this in their design review, to ensure products are of suitable quality and that they are sourced from reputable suppliers.

The selection of protective coating on steel poles can be galvanised or painted. With painted poles, the paint is applied over an already galvanised surface. Although paint deterioration is not detrimental to the life of the pole, painting is carried out to maintain the aesthetic look of the pole, as most are decorative.

Pole life expectancy is also influenced in part by the soil conditions. Acidity and water in particular can reduce pole life significantly; the resulting underground corrosion can go unnoticed if not checked by excavation around the pole base. As part of Council's street light maintenance strategy all steel poles fitting the criteria will be excavated and inspected during the next daytime condition rating.

New poles have a thick enamel type coating covering the entire ground planted section of the pole. This is a significant improvement over previous pole coatings. The manufacturer supplies a limited replacement guarantee period of 20 years for the pole coating system that pushes the expected life of these poles out from 30 to 50 years.

Renewal needs of other components are identified from the planned inspection programme. The strategy for renewal of street light assets, or components of those assets, is to:

- Renew faulty or damaged assets when renewal is more economic than repair. This includes unavailability of spare parts
- Renew faulty or damaged lanterns that are of technically obsolescent types
- Renew faulty or damaged assets that do not meet current design/safety standards

Work is prioritised according to public safety, co-ordination with other works, eliminating obsolesce, improved light outputs and cost savings such as reduced energy consumption

The amount of street lighting renewal work depends on:

- Their age profiles
- Their condition profiles
- The level of on-going maintenance
- The economic lives of the materials and components used
- The availability of replacement parts and fittings

Accelerated LED Replacement Programme: Enhanced NZTA funding assistance for the replacement of older technology streetlights with LED streetlights was made available mid-way through the 2015-2018 NLTP and for the duration of the 2018-2021 NLTP.

MDC tool full advantage of this assistance and renewed majority of Council (Roading) owned streetlight luminaries with modern LED type luminaires.

This bulk renewal will cause a funding spike when these lights reach the end of their economic life which is expected to be in 20 to 30 years. However, the enhanced NZTA funding assistance outweighs this with payback on Council investment in less than less than three years.

Asset Condition: The overall assessment of asset condition is undertaken using the following condition grading criteria:

Rating value	*Approximate remaining life*
Excellent	20 – 30 years
Good	15 – 20 years
Satisfactory	10 – 15 years
Poor	1 – 10 years
Very poor	0 -1 year

Condition ratings are undertaken annually by the maintenance contractor; poles, luminaires and brackets are assessed as individually. Results from the condition ratings are stored in the RAMM database.

The contractor formulates and supplies Council with a report based on the condition rating results; the reports form the basis of renewal and maintenance programmes.

The main cause of deterioration of streetlights is related to age, which in turn is related to exposure to the elements. For example, moisture causes the breakdown of electrical connections and components, and acidic or wet ground conditions can accelerate corrosion of steel poles.

Light output of HPS lamps depletes over the life span of the lamp which ranges from approximately 3 to 5 years. Once light output deteriorates most luminaires can be returned to their optimal or as new condition by installation of a new lamp and diffuser. In some cases, internal electrical components may also be needed, generally as a result of damage through moisture ingress. Most HPS type streetlights will be phased out by 2021.

LED streetlights are not expected to suffer any noticeable level of deterioration with the only maintenance required between installation and renewal being the cleaning of the LED lens on the underside of the luminaire. The frequency of the cleaning cycle is dependent on the environment where the streetlight is installed. The Council expects the frequency of the cleaning cycle to be in excess of seven years.

Brackets and poles suffer from corrosion problems and are also subject to vehicle collision damage. The deterioration of painted surfaces on decorative poles can lead to unsightliness.

Asset Capacity/Performance Data: Street light capacity and performance issues relate to light intensity, colour, reliability, safety and the areas of the townships covered.

Performance of streetlights can be a simple go/no-go test, i.e., the light either works or it does not. As the majority of luminaires are less than 3 years old it can be assumed that the luminaires are operating to their optimum performance level unless other factors impede function, vandalism for example. However, this approach only considers the function of individual lights and does not consider areas which may be under-lit due to wide spacing of luminaires.

This is a common issue where streetlights are mounted on power poles, as the common spacing between power poles less than the optimum for most streetlights. Design criteria varies between sites but to illustrate this issue an average optimum spacing between luminaires may be 60m where power pole spacing is normally around 40m. In urban areas streetlights are often installed on every second pole at spacing of around 80m.

The installation of lights onto existing utility poles, without the additional cost to install separate underground street light circuits and standalone poles, is very cost effective where this option is available.

It is acknowledged that the majority of the older street light installations do not perform to the current lighting standard. All new installations, undertaken by Council and those vested to Council by private developers, are required to meet current standards. The standards are considered for renewal work, where the existing pole is utilised to mount a replacement luminaire, but in most cases the lighting level required is not achievable due to the pole spacings.

Deficient installations will be progressively phased out as part of wider integrated works such as street upgrades when existing overhead services are placed underground, or when outdated lights are replaced along a street.

The Council accepts that unless large gains can be made lighting installations will remain as they exist.

Renewal Standards: When a number of adjacent lights are renewed at the same time, the lighting standards appropriate for that road are considered. Generally, the standard will not be met without the installation of new poles to enable luminaires to be spaced accordingly. Council does not require adherence to the lighting design criteria set out in the standards for renewal of lights fitted to existing poles.

When individual light fittings are renewed, the new fitting is generally the most appropriate modern engineering equivalent of the failed fitting. Replacement poles will generally be lightweight galvanised sectional-steel poles of appropriate height. Exceptions to both of these practices occur when the adjacent poles are of a decorative type, in which case appropriate decorative poles and luminaries are used.

NZTA Work Category

Renewal of streetlights is budgeted under NZTA Work Category 222: Traffic Services in the Council's Land Transport Programme.

Expected Lives: The expected lives of components are as follows:

- Luminaire | 20 years
- HPS Lamp | 4 – 5 years
- Standard galvanised pole and bracket | 30 years
- Tough Coat galvanised pole | 50 years
- Concrete pole | 70 years

Deferred Renewals: There are currently no deferred renewals for street lighting assets.

Asset Improvement and Development Plan

Streetlights are acquired or upgraded in the following circumstances:

- When new lights are provided by the Council where no streetlights previously existed
- When the Council streetlights are installed and vested in the Council as part of a new urban subdivision
- Through work to improve the level of service arising from

- Improvements in association with the street upgrading programme
- Minor safety improvements
- Improvements in association with undergrounding of overhead utility reticulation
- Recommendations from township committees
- Public requests on the discretionary street lighting funds

The undergrounding of existing overhead wiring is an important issue that can have a significant effect on the development of the street lighting asset. Utility companies rarely remove overhead wiring in the townships of their own accord. Instead, this is usually a result of the Council wanting to upgrade a street and improve its overall amenity by the removal of overhead wiring and associated utility poles.

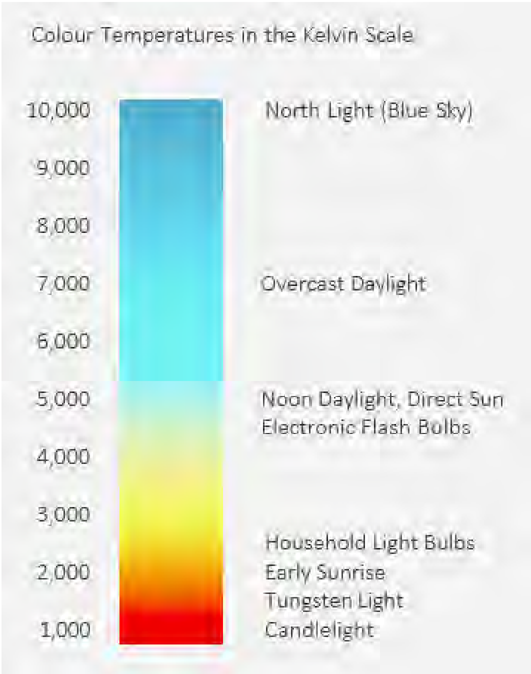
When Council undertakes a project where new underground street light cables are installed the cost is borne by Council but on completion, the cables are vested to PowerCo who agree to maintain the cables for the rest of their economic lives.

LED Technology: The use of Light Emitting Diodes (LEDs) has become the standard for new street lighting installations in New Zealand. Their use in residential streets and open spaces is proving to be a very cost effective option due to decreased energy and maintenance costs.

In most cases LED luminaires consume at least two thirds less energy than equivalent HPS luminaries. There are also significant savings made through reduced maintenance as the only planned maintenance the LED fittings require is occasional cleaning of the luminaire optical surface.

Development Strategy: The street lighting development strategy is to:

- Install lighting to improve road safety where a lighting problem is identified
- Specify installation of LED luminaires as a retrofit option in place of existing HPS luminaires
- To upgrade the lighting in residential streets to current standards when carrying out street improvements (where appropriate)
- To upgrade lighting in residential streets to current standards where possible when renewing obsolete fittings. (Often the existing obsolescent lights will be too far apart, even for more efficient modern fittings, and in these circumstances some new lights and sometimes new poles are required)
- To light rural intersections, where justified by safety concerns
- Upgrade urban lighting to meet current levels of service, especially where there are concerns about public safety



Development Standards: Light colour is an important consideration in selecting light fittings. The image below shows the Kelvin Scale (k) which grades colour 'temperature' and is used as performance criteria for light output.

The LED streetlights throughout the district are rated at 4,000k, which is a crisp white light that allows better perception of colour at night in comparison to HPS streetlights. HPS lamps emit light at 2,700k which is a more orange light that does not render colours as well, making recognition of objects harder or slower in comparison to 4,000k light.

Consideration of light colour temperature was when specifying the replacement LED streetlights, lights that produce white light to enhance safety for both motorists and pedestrians was preferred.

The following standards are applicable to the renewal of existing streetlights and new streetlights and installations:

- Current version of AS/NZS 1158 (excluding lighting design criteria for luminaire renewals)
- NZTA M30 Specification and Guidelines for Road Lighting Design
- All new installations, upgrades and maintenance must comply with the Electricity Act 1993 and Electricity Regulations 1993 and subsequent revisions
- Pole selection based on location, frangible in urban areas, shear base where appropriate in areas with speed limits above 70kph
- Lighting Design and Intensity
- LED technology is to be specified for all new installations
- Street lighting design shall be in accordance with AS/NZS 1158 Street Lighting series of standards. These set out requirements for lighting systems for roads and other outdoor public areas, primarily to provide a safe and comfortable visual environment for both vehicular and pedestrian movement at night
- Where lighting is provided for off-road walkways in townships, lighting shall be to the appropriate standard while not being over intrusive on neighbouring properties. This may require fittings different from those on trafficable roads

Management Programme: All lights, brackets and poles are maintained by an external contractor. For economy and efficiency reasons, the contract includes the lights on urban state highways administered by NZTA and lights under stewardship by other council departments. The NZTA reimburses the Council with the cost of maintaining and operating these lights on its behalf and costs associated with other council departments are portioned as identified by the asset owner.

Power for street lighting is based on the rated consumption of each light and the hours the lights are operating for. This information is supplied under an agreement with the Energy provider and paid directly by the Council.

4.3.18 Traffic facilities

Traffic Facility assets are predominately edge Marker Posts although the RAMM Traffic Facility table also houses some data on different traffic delineation devices such as bollards and speed deterrents.

Service Delivery and Rationale

Edge Marker Posts are replaced by the maintenance contractor when needed generally following damage from road users or the mowing activity. Damaged or non-reflective Edge Marker Posts are identified during the contractors regular network fault inspections and remedial action is taken in line with the requirements of the Maintenance Contract.

Asset details are recorded in RAMM when new Edge Markers are installed but due relative low value of the entire asset the data is not updated when they are replaced. For activity management and Valuation purposes Edge Marker posts are treated as a single asset which is always in average condition or halfway through its intended life.

Other Traffic Facility assets such as traffic calming speed humps are generally only installed following concern from residents or road users around motorist behaviour.

NZTA Work Category

Traffic Facilities are included in the Traffic Services group and are manage under NZTA Work Categories 122 for Maintenance and 222 for Renewal activities.

4.3.19 Treatment lengths (pavement layers and surfaces)

Roads are segmented into treatment lengths which are continuous sections of road which have the same dimensions and construction characteristics. This segmentation allows for efficient activity management as treatment lengths can be likened to individual assets even though they form part of the entire road network.

Changes in the top surface and pavement construction characteristics are the most frequently used method of segmenting road lengths into manageable treatment lengths. As condition deteriorates treatment lengths are further segmented to allow separation of sections that need intervention.

Overview of Assets

As of July 2023, there were 2,176 Treatment Lengths recorded for the network length of 1,373km, each treatment length has a set of the following components which make up physical construction of the road:

- Surface Structure, the current top surface of sealed roads
- Pavement Unsealed, the metal running course surface on unsealed roads
- Pavement Layer First Coat, the lowest layer of chip seal on sealed roads. This layer of chip seal is applied to seal the pavement when roads are built or reconstructed
- Pavement Layers, the compacted layers of metal that give the road structural strength
- Formation, the levelled base of the road on which the pavement layers are placed

Nearly all new pavements that have been added to the network in recent times have come about from new roads and streets vested to Council by private developers undertaking new subdivisions.

Surface Structure | Sealed Roads: The prime purpose of the top surface is to shed water, preventing it entering the structural layers underneath. The top surface also protects the top structural layer (Base-course) from the abrasive effects of traffic and provides the frictional properties required for safe vehicle use. There are two types of road surfaces in the district, thin bitumen surfaces (sealed surfaces) and metal surfaces (unsealed).

All of the District's rural sealed roads have chip sealed surfaces with a very small number having thin asphaltic concrete surfaces, both these surfaces are classified as thin surfaced flexible pavements; there are no structural asphaltic concrete, or other structural pavements. Often sealed roads were sealed by "dressing up" and sealing the previously unsealed road. This can lead to some of these roads deteriorating more quickly when they are subject to rapid changes in vehicle loading; for example, when a beef or sheep farm is converted to dairying the advent of tanker-traffic increases the quantity and weight of vehicles on the road network.

The most common surfacing used is a chip seal, which comprises stone chips embedded in bitumen sprayed onto the Base-course. This surfacing provides the most cost effective and best performing surfacing for thin flexible pavements in the district (i.e., thin pavement layers over sub-grades of a moderate to high strength). It is a very cost effective surfacing due to the availability of stone that can be extracted from local rivers or pits and crushed to the appropriate size.

When the pavement basecourse is new or reconstructed a First Coat Seal is applied, this has a relatively short design life due to the thickness of seal (remembering that the sealed surface's main purpose is to protect the pavement). A Second Coat seal is then applied which has a longer life, following that the surface is resealed at longer regular intervals. All seal design lives are dependent on by traffic volume and the seal design characteristics.

An average, anticipated cycle between reseals, when the pavement needs a further chip seal layer applied to maintain the integrity of the surfacing, is 16.8 years.

Asphaltic Concrete road surfacing comprises an approximately 30mm thick dense layer of mixed bitumen and small stone aggregate applied to the Base-course surfacing. It is known for its smooth black finish and is used predominately in new urban subdivisions for its aesthetic properties. It is also used in high wear and high traffic areas because of its durability.

Pavement | Unsealed Roads: Unsealed roads are quite dynamic in their performance and can have higher maintenance costs than sealed roads. This is because they require more regular intervention to maintain their surfaces and shapes because of the influences of weather and traffic. Unsealed roads have poorer riding characteristics than sealed roads and can create dust nuisances.

The principal maintenance activities on unsealed roads are application of a running course of AP20 metal and periodic grading to maintain an even running surface for vehicles to travel on. The rate of metal loss can vary between 5 to 10mm per annum depending on the use and location of the road and climatic conditions.

A typical problem with running course is that as a loose metal that can quickly migrate from the wheel paths, where it is needed the most, to the side of the carriageway under the action of vehicle wheels. While grading does reposition the metal this constant intervention can be considered inefficient.

Pavement Layers: Pavements are the structural and wearing course layers of a road. They are regarded as the core components of the roading network's trafficable carriageways. A major failure of a section of pavement can result in the road becoming dangerous and/or impassable.

Current practice is to provide additional strength to a road when it is sealed and to design the pavement for a standard 25-year life, however, the variability of conditions throughout the district prevents a blanket approach being taken to the structural design of roads.

The purpose of each road pavement is to provide an element of the network that is:

- of the vehicles and people using it
- Has a suitable all weather surface that is appropriate to its location and function in terms of skid resistance, noise reduction and smoothness
- Has a structure suitable to carry legal weight, and most cases overweight, traffic

Pavement Layers consist of the following principal components,

- **Sub-base** is a structural metal course laid and compacted on excavated and prepared sub grade, devoid of any organic matter or materials that could consolidate or settle. The sub-base is usually a coarser type of graded gravel, or metal.

Typically, it is a pit run material no larger than 65mm in diameter in layers on average 250mm thick. The subgrade and subbase layers are identified in the asset valuation table by Subgrade Formation

- **Basecourse** is laid and compacted over the sub-base but to a higher standard. It is the main load- carrying component of the pavement. It also provides the final alignment and shape of the pavement and accepts the surfacing. The base is made of crushed rock that conforms to a "grading envelope". The size grading allows it to be placed and compacted to higher tolerances than the sub-base. In practice, it is placed in a layer 100mm to 150mm thick, or thicker when high loadings are expected. It is usually specified as M4 AP40, the M4 designation referring to the NZTA specification of that name and the AP40 designation to a material that will pass through a 40mm aperture sieve. The base-course layer is identified in the asset valuation table by Pavement Formation
- **Pavement First Coat** is the first layer of seal applied over the finished base-course, this and the subsequent Second Coat Seals and Reseals become part of the pavement structure when they are no longer the current top surface

Formation: Formation consists of the bulk earthworks required to provide the shape and a firm platform for the structural components of the road to be built on and - for the purposes of this section of the Plan - the land on which the carriageway is built, and land held for future road construction.

Operations and Maintenance Plan

Strategy Operations and Maintenance Goals: General maintenance work is classed as priority work where:

- The safety of road users may be compromised
- The required level of service has fallen below the prevailing level for the adjacent parts of that section of road
- It is likely that the area of distress may expand so that the road is incapable of providing the required level of service and a renewal or upgrade will then be required
- The scope of repair work would change to be become significantly more expensive, if left to deteriorate further.

Subsequent maintenance, renewal or new improvements work depends on the completion of the planned maintenance repair

A suitable level of preparedness for prompt and effective response to asset failures and emergencies is maintained by ensuring the availability of suitably trained and equipped staff and service delivery contractors. This is provided through specific requirements detailed in maintenance and other roading contracts.

The initial, practical and objective response to asset failures is to restore service as quickly as possible by the most economic method available. This may mean having to make temporary repairs to maintain a level of service if the repairs or renewals are time consuming to complete.

The Council's operations and maintenance strategy is to implement the most cost effective maintenance options through:

- Adequate monitoring the condition and performance of assets
- Investigation of any system deficiencies which are outside the parameters of the target level of service
- Identification of the most appropriate work required to correct defects

To achieve this, assets are monitored through routine proactive inspections, testing, and analysis of customer complaints and condition reports. Service levels are managed by assessing the consequences of asset failure and assessing the levels of customer expectation. Asset ownership costs are minimised by identifying, evaluating and introducing new technologies and equipment that may improve operational and management efficiencies.

Exposure to risk is managed by maintaining up to date fault detection systems and providing a prompt and effective response to system failures. This exposure is also minimised by maintaining insurance on key insurable assets, undertaking structural checks of key assets and controlling environmental impacts.

A partnering approach is sought and encouraged between the Council's staff, consultants and contractors; its aim is to make effective use of resources, systems and procedures by taking collective ownership of these matters and transportation network.

NZTA Work Category

Treatment Length assets are included in the following NZTA Work Categories for Maintenance and Renewal activities:

- WC111: Sealed Pavement Maintenance
- WC112: Unsealed Pavement Maintenance
- WC211: Unsealed Metalling (renewal)
- WC212: Sealed Road Resurfacing
- WC214: Sealed Road Pavement Rehabilitation

Pavement Maintenance Plan

The Council's contract specifications establish the adopted technical levels of service, which in turn deliver the agreed customer levels of service, thus applying the Long Term Plan's Community Outcomes to transportation.

Roading work is required to conform to a number of funding guidelines, which are set out in an annual Land Transport Programme Relationship Protocol between the Council and NZTA.

Council staff and contractors work to ensure that the road network is maintained to the specified standards while staying within the approved budgets. Individual carriageways may be below the specified standard for short periods, but this is only permitted if the road user is not unduly affected.

For example, minor patching work may be undertaken to hold over a pavement until the full repair is done. If the work is urgent, it will be done, even if this means that there is expenditure over the budget or other less important work has to be deferred to keep overall expenditure under budget. Safety related work always takes priority.

Generally, the budgets have been based on historical and predicted trends and set at levels that permit the maintenance work necessary during the year to be done.

Agreement is established around three sets of maintenance guidelines, achievement of which is measured against:

- Safety
- Asset preservation
- Road user satisfaction

These measures, and progress towards these achievements, are reported to NZTA at regular intervals by the Council.

Routine Maintenance: The majority of maintenance work carried out by the maintenance contractor is self-identified. Roads included for reseal have all maintenance work identified and carried out prior to reseal. This is to ensure the pavement is in its best condition to receive the new surface Pre-reseal repairs are discussed further under Pre-Reseal Repairs below.

Council activity management staff and the road maintenance contractor work together to ensure that the road network is maintained to the specified standard while staying within the approved budgets.

Seasonal conditions and the need to co-ordinate routine and planned works may mean a carriageway is below the specified standard for a time. However, this is only accepted or tolerated if the road user is not unduly or adversely affected. For example, some minor patching may be held over until a full repair is done, or grading of a metal road may be deferred due to adverse weather conditions (either wet or dry). Generally, the budgets are set at a level that permits the maintenance work necessary during the financial year.

A schedule of proposed reseals is given to the Contractor and inspections made to identify repair work necessary to prepare the carriageway for the reseal. The preliminary schedule of reseals is usually given to the contractors in August with inspections done and work approved over the following two months and the work completed prior to Christmas. Pre-reseal repairs can cost up to one third of the total value of the reseals carried out that year.

The Contractor also identifies maintenance work such as dig out repairs, edge breaks, culvert, renewals, minor bridge repairs and shoulder removal during the routine course of activities and network inspections. A schedule of work is submitted for approval to the Engineer, then once approved it is programmed and completed by the contractor.

Maintenance Programme: The nature and frequency of the work is consistent with the maintenance strategies outlined above and the age, condition and performance of the roading asset. The majority of maintenance work carried out by the Contractor is routine and can be undertaken within predefined discretionary limits without initial approval of the Engineer. There are exceptions to this general rule with some maintenance activities requiring pre-approval.

Forward work programmes are developed and maintained so the scope of up and coming work is known and quantified. The work is identified from RAMM data, the Engineer and the Contractor. These programmes are used to track progress and the costs of work in relation to the budgets available. The forward works programmes are updated regularly due to reprioritisation as other work is identified, arising from more recent network inspections or public service requests.

RAMM is used to manage the Forward Works programme for reseals and area wide pavement rehabilitation work.

Deferred Maintenance: On a network basis there is generally no significant backlog of routine maintenance at current funding levels. The exception to this is drainage work on unsealed roads, in particular the removal of high shoulders. The Council wishes to make more progress on issues surrounding this to the overall betterment of these types of pavements.

The aspect of pavement maintenance that typically has the highest levels of perceived deferred maintenance is that associated with the maintenance metalling of unsealed roads; however, this is not necessary seen as deferred work, rather it is most commonly a difference in level of service expectations.

Adverse climatic conditions such as a wet winter or a storm event can create additional pressures that mean that scheduled maintenance metalling work may need to be deferred to address the more urgent problems that arise from these types of events. If an event is serious enough, and creates repair and reinstatement that cannot be sensibly met from normal funding allocations, RCA's can apply additional funding from NZTA under Work Category 141 – Emergency Reinstatement.

Prioritising Work: As the contractor's general staff cover most roads in the district at far more frequent intervals than those stipulated as part of the day to day management of the contract, there is the expectation that the contractor will capitalise on this opportunity to enable work to be identified, carried out or reported for back for approval and prioritisation.

Maintenance work identified by the Contractor is either:

- Prioritised as immediate, in which case it is programmed and completed by the Contractor forthwith. This includes routine work such as pothole repairs, short sections of edge break, small areas of surface levelling, and removal of surface detritus; or
- Scheduled as part of identified work submitted to the Council's Engineer for approval monthly. Once approved by the Engineer it is included in the schedule of all approved work. A three-month forward work programme is maintained by the contractor and updated monthly. The month the work is programmed is also noted in the schedule of approved work

Work is generally programmed in accordance with the following priorities, but may be scheduled differently if requested by the Engineer to meet non-roading priorities, e.g., utility services installation or repairs:

- The safety of road users or adjacent property owners is, or is likely to be, compromised
- The structure or integrity of the road or road component is or is likely to be compromised
- The areas of distress may expand or the method of repair change, such that the cost of any repair may increase significantly
- Other programmed work depends upon the completion of the work in question
- The order in which it was approved approval

At times there is a greater value of work approved than budgets will allow to be done. The Engineer keeps the Contractor informed monthly on how the expenditure relates to the budget and will request certain types of maintenance work to be put on hold if expenditure is close to the budget. Generally, this applies to the work types with the larger budgets such as maintenance metalling, digout repairs and drainage.

Calls from ratepayers, road users and the Council's staff are another, less formal, form of network surveillance and a gauge on contractor performance. These calls are logged into the Council's Service Request System with relevant items passed onto the Contractor, with instructions where necessary, for assessment and/or remedy. Other defects or works required are noted as part of any additional inspections following Service Request enquiries.

Cost increases caused by inflationary pressures such as oil price increases can affect the ability to carry out all necessary work and stay within budget. Cost increases resulting from inflation cannot be economically written out of contracts and all the Council's period contracts therefore include them. Cost escalation adjustments are regularly applied to contract rates and prices.

The maintenance budgets for each year are adjusted to reflect the previous year's inflation in that particular part of the industry. This is done using standard construction cost indices compiled by the NZTA. Failure to increase annual budgets to match the costs of inflation over the previous period will usually result in failure to achieve the agreed levels of service, and a loss of service potential.

Urgent work is generally completed even if this means that there is expenditure over the budget or other work has to be deferred to keep overall expenditure within budget. This is particularly relevant to safety related works and other works that are needed to restore roads affected by adverse weather events like storms that result in wind damage, flooding, slips and snow. As discussed in Emergency Works, if the extent of this becomes too severe the Council can apply for NZTA Funding for additional funding.

General Maintenance | Sealed Pavements

Sealed road pavement maintenance includes:

- Pothole repairs

- Digout repairs
- Surface levelling
- Repairs to seal edges (edge break and shoulder wear)
- Trimming of high shoulders to ensure drainage off the carriageway

Details of the various types of defects and the method of repair are in detailed in the Road Maintenance Contract specifications. In general, small repairs such as potholes, short sections of edge break and small areas of surface levelling, are completed by patching trucks as part of their routine circulation around the district. Other routine maintenance activities are carried out as needed by the Contractor.

The maintenance of private entranceways within the road reserve is carried out as part of the carriageway maintenance. This is subject to the entranceway being previously formed and sealed to match the carriageway. Unsealed entranceways are only maintained at the seal edge, unless there is significant damage to the seal edge in which case the entranceway will be sealed to 1.5m from the carriageway edge in conjunction with the roading work, this is to ensure that the edge of the sealed carriageway is kept intact.

Pre-Reseal Repairs: Pre-reseal repair work is carried out under the road maintenance contract. The purpose of this work is to ensure that all defects are repaired prior to the reseal. It includes high-shoulder removal, which consists of the trimming of the existing shoulder and berm to remove the build-up of soil, vegetation and chip at the edge of the carriageway. The formation of shallow drainage-swales to move runoff away from the pavement formations is also done at this time.

The co-ordination of shoulder maintenance and re-seals ensures that over time the entire network will have improved drainage that is regularly attended to, as part of the reseal cycle. This work also helps to prevent or minimise damage to the carriageway that can occur from remedial shoulder maintenance works.

The majority of the shoulder removal and digout repair budget is spent on the roads being resealed. By doing this as pre-reseal work the entire network will get shoulders trimmed and the failed area of pavement dug out during the reseal cycle.

General Maintenance | Unsealed Road Pavements

Maintenance of unsealed roads consists of the routine work such as grading, pothole patching, isolated gravelling, the removal of high shoulders, placement of Base-course to provide the normal camber of 4.5 to 6% and placement of running course. Pothole patching, removal of corrugations and rutting is carried out as needed by the Contractor.

Grading and Pothole Repairs: Grading is done on a set frequency for each road section. Additional grading is done, outside the set grading frequencies, if the condition of the road falls below the stipulated performance standards. The grading frequency is based on that historically needed to maintain the carriageway to the required standard. This is based on information obtained from long-serving staff, observation of the roads, and from the contractor who also recommends changes to the frequency if necessary.

The grading frequencies are routinely reviewed. Without exception, the frequency of grading has only ever increased; no road section has had the frequency of grading decreased. Corrugations are cut out as part of routine grading. The specification requires corrugations greater than 25mm high (trough to crest) to be cut out. Some corrugations shallower than this can still cause concern to road users and the contractor is usually asked to cut these out as part of the next grade.

Drainage work to reduce surface water on or at the edge of sealed and unsealed carriageways is carried out following identification and approval.

Pothole patching and isolated gravelling are done by the contractor where needed and generally to coincide with the grading cycle, repairs being done prior to the grading. This is done to maintain a carriageway that is becoming worn but does not yet need major renewal.

Maintenance Metalling: Carriageways that cannot be maintained to the required standard through regular grading and patching are scheduled for approval of the work necessary to overcome the problem. This may include trimming of high shoulders, or replacement or reformation of all or part of the Base-course and running course.

Four main types of "maintenance" works are undertaken:

- Stabilise Existing Running Courses
- Repair Sub-base and Reform Carriageway
- Reshape Existing Carriageway
- Place New Running Course

Programmed Application: A decision process for the application of metal is based on a performance management evaluation undertaken by Council engineers and inspectors. This methodology has shown deficiencies and inconsistencies of ensuring a consistent running course layer application. Future programmed applications are to be based on the theoretical gravel loss prediction model. This provides consistent protection to the base formation of the unsealed road, manages pavement deterioration and provides a quality material suitable for ongoing grading and compaction.

Predicted gravel loss model: A 10mm theoretical gravel loss has been assessed as applicable for the Manawatū District Unsealed roads. This model makes no allowance for variable traffic volumes on the unsealed roads. Therefore, a modified calculation is applied to the lower volume roads as the gravel loss is reduced due to the lower traffic volumes. Typically, these lower volume roads are no-exit roads servicing two or three properties.

Unsealed Road Average Daily Traffic Volumes: Council's unsealed roads are categorised into 4 bands based on traffic volumes. Traffic counting programmes are generally not undertaken on unsealed roads so local knowledge of the network is applied to assign the category accordingly.

- Unsealed 1 (U1) <25 vpd
- Unsealed 2 (U2) 25 – 50 vpd
- Unsealed 3 (U3) 50 – 75 vpd
- Unsealed 4 (U4) >75 vpd

Re-metalling: Anticipated maintenance aggregate application quantities, using GAP 20 (10,000m^3), GAP 40 (1,500m^3) and GAP 65 1,000m^3):

Road Category	*ADT*	*Road km*	*Gravel Loss per Annum (mm)*	*Application/annum m^3*
U1	<25 vpd	38.73 km	5	2,336
U2	25 – 50 vpd	95.62 km	5	7,450
U3	50 – 75 vpd	186.25 km	10	1,912
U4	>75 vpd	58.41 km	10	774
		379.01 km		**12,472 m^3**

Isolated re-metalling is also carried out as needed. The roads in need of upgrading are identified by the Contractor and by the Engineer by observation or following complaints from ratepayers and road users. These roads are listed and prioritised by the Engineer and programmed in accordance with the most effective use of the available funds.

The re-metalling list is reviewed regularly to reflect changing circumstances. The contractor, following the identification of sections of road in need of upgrading and approval of the proposed work carries out placement of new metal courses when approved by the Engineer.

Grading Frequency:

Road Category	*ADT*	*Road km*	*Grading Frequency per Annum*	*Grading km per annum*
U1	<25 vpd	38.73 km	2	77.5
U2	25 – 50 vpd	95.62 km	3	286.9
U3	50 – 75 vpd	186.25 km	6	1,117.5
U4	>75 vpd	58.41 km	12	700.9
		379.01 km		**2,182.8 km**

Response Times: Response times are set in the maintenance contracts, and the actual performance of customer-raised queries is recorded through the Council's Service Request System.

The contractor receives requests for service through this system, and notifies of the completion of a request utilising the same system. Regular audits are undertaken to identify any outstanding issues and to ensure that the work has been done as required and that it meets specification.

Reactive Maintenance and Response: A suitable level of preparedness is maintained allowing prompt and effective unscheduled responses to emergencies and asset failures. This is achieved by ensuring the availability of suitably trained and equipped staff and service delivery contractors.

The initial response to asset failures is to restore service as quickly as possible using the most practical and economic method available. Temporary repairs will only be made if major repairs or renewals are time consuming to complete. Response requirements for routine maintenance activities and emergency events are listed in specific maintenance contracts.

Renewal/Replacement Plan

Renewal Goals: The overall objective for rehabilitating and renewing pavements and pavement surfaces is to apply the correct treatments at the optimum times so that the required level of service is delivered, and total life cycle costs minimised. The required level of renewal will vary depending on:

- The age profile of carriageway surfacing and structure
- The condition profile of carriageway
- The level of on-going maintenance demand
- The differing economic lives of the materials used
- Traffic growth

Pavement Capacity: The bulk of the network is coping well with the current traffic volumes and loadings. It only requires routine maintenance and scheduled end-of life renewals like resurfacing, for it to deliver the agreed levels of service.

Pavement strength is rarely a problem on sealed roads carrying low volumes of heavy vehicles on good sub- grades.

Old, sealed pavements that have had no previous rehabilitation were generally built on existing unsealed formations with no specific sub-base and a minimum of Base-course (often about 100mm). They are generally coping well with current volumes of light traffic, however these roads do not perform well with higher volumes of heavy vehicle use (log extraction, for example).

Sealed pavements in the district usually fail for one of the following reasons:

- They have an old seal with poorer quality pavement metal than normal
- They are higher volume arterial roads, particularly in urban areas
- They are on rural roads that were seal-widened 20 or more years ago when the additional width was often constructed to a lower standard than the existing sealed surface

Failure of these sections can be a driver for renewal of rural carriageway sections.

Unsealed roads usually require pavement renewal for one of two reasons:

- Failure of the pavement structure, this is similar to that occurring on sealed pavements
- Insufficient renewal of the metal surface, resulting in traffic running on the pavement structural layers, eroding and damaging them

Unsealed roads pavement renewals are identified through inspection, network knowledge and maintenance issues, as discussed previously.

Rehabilitation usually consists of a granular overlay on rural road roads, or a reconstruction on urban roads where the additional depth of metal cannot be accommodated within the existing levels established by the kerb and channel.

Identification of Work Pavement Structural Layers: Treatment sites and forward work programmes for sealed roads are identified through: Analysis of road inventory and condition information held in the RAMM System

RAMM Treatment Selection: This module of RAMM identifies carriageway sections based on analysis of life cycle data, traffic volumes and pavement condition for a broad range of treatment options. It provides a forecast over a two-year period for short term planning processes. Contractor and Council staff inspections.

Sealed Surfacings: Council has historically operated a rolling forward works programme based on the expected life of the surface to identify reseal sites. From 2014, RAMM and inputs from condition rating surveys have been used to assess the surface condition and then generate the forward works programmes based on these results and visual inspection by council staff.

The strategy adopted for renewing sealed surfaces is to reseal pavements as close to the possible to the end of each seal coat's economic life. This is determined by the condition of the pavement and demonstrated by factors such as:

- Crack initiation because of brittle binder
- Loss of binder adhesion and stone loss
- Lack of water proofing resulting in potholes and other failures
- Loss of macro texture resulting in loss of skid resistance
- Loss of surface integrity, especially if the existing seal has been subject to potholing, trenching, edge break and digout repairs

The following factors affect material selection:

- Traffic volume, percentage of heavy vehicles, and road geometry, and adjacent land use zoning
- The flexibility of the existing road formation, e.g., thick asphalt is a semi-rigid material and requires special design if laid on a flexible foundation, or on a pavement formation of insufficient strength to accommodate vehicle loading stresses
- The proximity of dwellings to the carriageway and potential for noise nuisance
- Road pavements that are structurally sound, but have unacceptably rough surfaces, can be rehabilitated by the application of a levelling coat of asphalt
- A trend towards increased use of thin asphaltic concrete surfacing on main roads in townships to reduce surface roughness, traffic noise and bitumen tracking to improve street amenity value

Nevertheless, after consideration of all these factors, chip seals remain the predominant sealed surfacing on urban and rural roads in the district. Use of asphaltic concrete surfacing is increasing in urban areas. It is expected that there will be a steady increase in the length of urban roads with this surfacing because of its popularity with developers and ratepayers and increasing scuffing problems in high-wear areas, attributable to larger trucks.

Roads for resealing are identified or selected as follows:

- Potential reseals are short listed according to
- Second coat seal requirements (i.e., the need to reseal over first coat seals resulting from seal extensions, and seal widening projects, reconstruction and rehabilitation works)
- RAMM Treatment Selection Algorithm output
- Seal life cycles
- Individual road section maintenance histories

All short listed sites are inspected by suitably qualified and experienced staff and the priorities suggested from the preceding steps adjusted as appropriate.

Co-ordination with other works such as utilities maintenance and renewal work, i.e., the reseal is delayed to incorporate any first coat seals that result from these works.

Renewal Practices: Pavement renewal on sealed roads is often carried out because of failure of the pavement resulting in a rough surface and poor ride. Roughness and other pavement condition factors are uses to assist assessment of sites requiring pavement renewal. Roughness counts high enough to cause sufficient discomfort or increased road user costs are unlikely to qualify for pavement renewal on this basis alone, renewals are more likely to result from an inherent structural failure of the pavement.

Rutting of sealed surfaces is a better indication of pavement life, and that the onset of rapid rutting is a reliable indicator of the end of a pavement’s life. There is more research being carried out on this subject nationally at present. The Council will continue to monitor this research with a view to enhancing its ability to forecast renewal requirements.

Council is often unable to obtain sufficiently high benefits to justify pavement rehabilitation on a benefit cost ratio basis. However, the roads that will require renewal works typically have high maintenance costs, and rehabilitation of these sections is usually justified using least-cost analysis techniques. Similar problems are not encountered with obtaining financial support for resealing. The types of renewal work undertaken are discussed below.

Reseals: As seals become old, they become more brittle and tend to fracture under traffic loadings, this allows the ingress of water and leads to the formation of potholes, and in the worst cases, to failure of the pavement structure.

The predominant resealing technique used is chip sealing. It is used predominately on rural roads. Asphaltic concrete (AC) (hotmix) is used as a more resilient surface where there are high turning stresses, e.g., at cul-de-sac heads, intersections, retail, commercial and industrial areas. They are also chosen for use in urban areas from both an aesthetic perspective, to reduce road noise to adjoining properties, and address the issue of tracking bitumen in hot weather which can cause damage to floor coverings when it is carried into buildings on the soles of footwear in retail areas.

Granular Overlay/Rehabilitation: These techniques are used where only parts of the pavement are exhibiting distress and it is more cost effective to repair only these areas. The life of a sealed pavement is extended by construction of an additional layer of base-course finished with a sealed surface. This technique is generally referred to as an Area Wide Pavement Treatment and is used predominately on roads without kerb and channel.

This technique can be unsuitable where there is existing kerb and channel, such as in urban areas, as it builds up the crown of the road or street so that the resulting cross-fall becomes too steep preventing residents' vehicles from accessing their properties without "bottoming out". In these circumstances it is usually more efficient to carry out a full reconstruction as described below and replace the pavement, and often the kerb and channel, to the appropriate levels.

Full Reconstruction: This is the removal of the existing Base-course and/or sub-base and its replacement with new metal courses and a new sealed surface. This is the most likely technique used on urban streets and generally involves renewal of kerb and channel, and in some cases catch-pits and pipes to storm-water mains, footpaths and berms.

If a full reconstruction is carried out this is often undertaken in conjunction with replacement of other utility services such as storm water and sewer mains.

Renovation: This increases the strength of existing Base-course/sub-base materials by chemical stabilisation such as adding a stabiliser (hydrated lime or cement) and re-compacting. This involves the pavement being ripped in-situ and re-laid in place by heavy plant. This technique can incorporate blending in of new materials and stabilisation measures. This is used when the existing pavement formations can be reused in a reconstituted manner.

Smoothing: Irregularities in the road surface, where the structural condition of the carriageway is sound, are smoothed by placing additional (thick) surfacing on an existing sealed surface to smooth out irregularities. The materials used depend on traffic volumes/road geometry and road condition. The most commonly used materials are cold emulsion mix and asphaltic concrete (hotmix). NZTA Work Category 214 - Sealed Road Pavement Rehabilitation and 324 - Road Reconstruction are the specific categories that encompass these types of work. They have previously been generally referred to and categorised as Shape Corrections.

Standards and Specifications: The Council's standards and specifications for renewals reflect the best and most appropriate use of current technologies, in accordance with national standards and legislative requirements as detailed previously in conjunction with maintenance and operational activities.

Prioritising Renewals: In addition to the pavements condition and likely remaining useful life, i.e., its ability to deliver the agreed level of service, consideration is also given to the needs of other adjacent assets that may require attention soon. For example:

If a road is getting near the end of its life and the sewer running below it is due to be replaced in two years requiring extensive works in the road, then the road renewal works would be programmed to coincide with the sewer works. Alternatively, if the road works were more urgent the sewer works would be brought forward

During upgrading of older urban streets, the opportunity is usually taken to combine the renewal of all the urban roading asset components such as footpaths, kerb and channel, streetlights and the pavement. This has proven to be an economic and practical approach, and is commonly referred to as a "street upgrade".

The district's roads and streets are important corridors for the location of non-roading services and they need to be considered when planning pavement and street renewal works, in urban areas the street take on even greater significance for these services, which can include:

- Sewers
- Water supply reticulation
- Stormwater drainage networks
- Electricity, telephone and street light poles and associated cables (overhead and underground)
- Water races

Implementation of the "Code of Practice for Utilities Access to the Transport Corridor" should assist with more integrated planning of works in future.

For the purpose of allocation of available funds, a broad renewal priority order has been adopted. This is a guide only, and is varied as circumstances warrant. The priority order reflects the goals of safety and road efficiency.

- Resealing
- Bridge Replacement
- Area wide treatment, road rehabilitation and reconstruction
- Footpaths reconstruction and resurfacing
- Road Signs, Markings and Control Structures
- Car Park Resealing and other works

Pavement Renewal Programme

Reseals: The process used to identify sites for annual resealing programmes is to:

- Identify the candidate sections of carriageway based on a comparison of age and expected life, suggested treatment or intervention from RAMM Treatment Selection and knowledge of the network
- Examine forward works programmes, including those of other network utilities such as water and sewer, for clashes or other factors that may influence the decision to reseal
- Confirm and prioritise sites following site inspections and inter-programme co-ordination
- In selecting the most suitable surfacing material for each category of road the impact of that material on the total pavement life and the life cycle cost are considered

The length of sealed roads continues to increase because of seal extensions and new subdivision roads.

Rehabilitation and Reconstruction: The quantity of historical and projected pavement renewals is much lower than the theoretical annual renewal length. As discussed earlier there are no condition indicators that suggest that the network is deteriorating from lack of maintenance, the current approach to selecting pavement rehabilitation sites is as follows:

Identification of carriageway sections based on RAMM Treatment Selection Analysis, which analyses average life data for treatment's option, the volume and mix of traffic using the road, pavement condition, roughness and costs.

Larger sections, and those requiring funding outside normal allocations, require justification under NZTA's project evaluation criteria, which generally require a project to obtain a BCR greater than 4 to be considered eligible. With the network's very low roughness counts, even on pavements that are at the end of their lives, it is often difficult to obtain the required "benefit" to justify the work.

Rehabilitation and reconstruction work is therefore often justified by showing that it is the least cost option for the Council and the NZTA (this approach differs from BCR in that road user benefits and costs are not considered)

The type of treatment, its need and priority identified from RAMM outputs are confirmed through a physical inspection of all candidate sites, good knowledge of overall network condition, and technical assessment by experienced staff, and where required consultants, using sound engineering principles.

Any works failing to attract NZTA financial assistance for specific funding are be considered for an alternative strategy of "heavy maintenance repairs" or other repair strategies to improve the pavement before resealing.

A rural roadside drainage programme has been established to improve drainage and reduce the risk of pavement structure failure due to moisture ingress. This involves a cycle of reshaping surface water channels/swales.

4.4 Environmental management

4.4.1 Stock crossing/droving

Stock droving is permitted on roads within the district, but it must comply with the requirements of the Council's Traffic Safety and Road Use Bylaw 2023, Part Five: Stock on Roads. Alongside this bylaw sits the Road Controlling Authorities, Best Practice Guidelines for Stock Crossings 2014 and the NZTA New Zealand Guide to Temporary Traffic Management.

Farmers must obtain the appropriate consent in advance of when the droving or crossing activity will occur, where it exceeds normally accepted standard conditions, practices and expectations detailed in the bylaw.

The current bylaw reflects the Councils current responsibilities towards the control of the activity. It balances the needs of farmers to use public roads for moving stock against the rights of other road users, primarily from a road safety perspective, in a fair manner. In addition, with the increase in rural residential subdivision that has occurred in the district, the resulting new property owners are much less tolerant to rural farm practices, such as stock and effluent on rural roads, than the original farming communities. Again, Council has had to balance the needs and rights of the respective road users in a fair manner.

Maintenance: The consents for the regular droving of dairy cows directly across roads requires the farmers to take all reasonable and practicable steps to clean, scrape or sweep the road, conditions may be imposed to implement methods to minimise fouling and damage to the road surface.

Underpasses: There are 51 stock underpasses in the district; these are constructed to an agreed standard, and each required a building consent. Upon completion of an underpass's construction, it is inspected by a Council Engineer who must approve the structure before the Code of Compliance Certificate is issued. Councils policy for stock underpasses contains specific details regarding construction and maintenance requirements of stock underpasses.

The Council offers a subsidy on the construction cost up to a maximum contribution of $5,000 for each approved underpass, payable once a Code of Compliance Certificate has been obtained.

4.4.2 Surface detritus, litter, roadside rubbish and street cleaning

Surface Detritus is defined as:

- Any collection of fragments and/or material on sealed surfaces and in drainage channels, including loose sealing chip and loose pavement aggregates
- Any material that impedes the efficient operation of existing drainage
- Frettings from cuttings
- Deposits of windblown sand, grit, loose aggregates, or fallen leaves
- The results of build-up of minor droppings or spillages from passing traffic or climatic conditions
- Broken glass
- Silt and small weed growth in lined channels

Locations of sealed surfaces include all of the following:

- Road carriageways over their full width, including sealed shoulders, shoulder zones where cyclists ride, designated cycle zones/lanes, and intersections

- Central median islands, splitter lands, threshold islands, roundabouts, and central medians
- Footpath surfaces
- Driveway and accessway entrance surfaces between the sealed carriageway and property boundaries
- Lined and unlined drainage channels

Surface detritus removal is managed by the road maintenance contract.

Litter is defined as:

- Any single item with a dimension greater than 75mm in any direction which is visible from a vehicle traveling at 70 km/hr
- Items such as tyre fragments, car parts, scrap steel, metal, timber, concrete, large stones, bricks, paper, cardboard packaging, refuse, rubbish, garbage, broken glass (see exclusion below), glass bottles and containers, plastic bottles, plastic bags, plastic sheeting, metal cans, plant debris including fruit fallen from trees, inorganic waste matter, or any other material of like nature weighing less than 40 kg

Removal and disposal of litter is managed under the road maintenance contract.

Roadside Rubbish (over 40kg) deposited on roadsides, referred to as fly tipping, comes under the responsibility of Council's Solid Waste Management Contract. Generally, the location of sites where rubbish has been dumped is notified to Council by contractors, council staff, ratepayers or road users.

Due to the road maintenance contractors coverage of the network, it is more cost effective for the council to utilise their services to collect and dispose of roadside rubbish rather than to send the solid waste contractor to clean up sites, which are often remote locations. At the time of the contractors payment claim, the cost of collecting and disposing of this type of rubbish is transferred to the Council's Solid Waste Management budget.

Any incriminating content in the rubbish is collected by the contractor and handed to Council's Compliance and Monitoring Team so they can pursue infringement of the person responsible if this is possible.

Street Cleaning activity covers the inspection, reporting, programming, and cleaning of urban kerbs and channels, sump tops, property access culverts and slot crossings, and adjacent road surfaces.

Street cleaning is defined as the removal of all debris (including loose aggregate, litter, sand, grit, leaves, bottles, cans, cigarette butts, graffiti, and other unsightly or deleterious material) and detritus up to a maximum of 40 kg per individual item.

The area defined for street cleaning is the area from the kerb face to a distance of 2m into the road carriageway. Street cleaning is managed under the road maintenance contract.

Cleaning is carried out to maintain the level of service on the following schedule:

- CBD Areas shall comply with the specified level of service every morning at 8.00am.
- Commercial Areas in front of commercial properties outside the CBD area shall comply with the specified level of service every Monday morning at 8.00am.
- All Other Areas other than CBD or commercial areas shall comply with the specified level of service: At 2.00pm. on the closest working day to the fifteenth day of the month, and at 2.00pm. on the last working day of the month

Additional cleaning is also carried out on new subdivision roads to remove debris tracked out onto the carriageway from construction vehicles accessing muddy building sites. This has become more important as stormwater systems have become more complex and sensitive, to avoid them from becoming clogged or rendered ineffective and/or in breach of specific resource consent conditions relating to their operation.

Cleaning is done by mechanical sweeping where this can achieve the standard of cleaning, but hand cleaning is done in conjunction with this on dish channels, channels with non-standard shapes, or those that have berms and trees in front of the channel, and those that have channel covers or slotted channels at entranceways.

A proportion of funding for this work is budgeted under the NZTA Work Category 113: Routine Drainage Maintenance in Council's Land Transport Programme. Current NZTA rules for the funding of street cleaning mean that only 30% of the total cost is subsidised. The remaining 70% is required to be fully funded by Council.

The details include the funding necessary for street cleaning in both the subsidised and non-subsidised portions of the financial forecasts.

The cost of street cleaning undertaken on State Highways in townships is recovered from NZTA – State Highways Group.

4.4.3 Abandoned vehicles

Abandoned Vehicles are the responsibility of Council's Environmental Services Department. Identification, removal and disposal of abandoned vehicles is undertaken by the Council's Animal Control Officers, who have the necessary dual purpose vehicles, trailers and storage areas to remove and store vehicles. The processes pertaining to abandoned vehicles are contained in Section 356 of the LGA 1974, Removal of Abandoned Vehicles from Roads. This details, amongst other things, the Council's responsibility to identify the owner of the vehicle before sale or disposal.

The funding for this activity is not included in this Plan.

4.4.4 Vegetation control

Vegetation Control applies to grass, plant pests, shrubbery, exotic seedlings, trees, and any other plant growth within the legal road reserve.

Exotic seedlings are plants up to 2,500mm in height and include:

- Poplars
- Wattles
- Pinus radiata
- Macrocarpa
- Lupin
- Pinus pinaster
- Gums
- Flame Trees
- Willows
- Pampas

All plant pests are described in the Horizons Regional Council's Regional Plant Pest Management Strategy, including Horsetail (Equisetum arvense).

Vegetation control is managed under the road maintenance contract. The Contractor is to ensure that the work carried out on legal roads reserves is such that:

- At all times the area from boundary to boundary is free of exotic seedlings and plant pests
- At all times the area remains free of all vegetation encroaching within the ‘control envelope’
- At all times the vegetation on unsealed shoulders and other nominated areas is maintained to the specified heights

Sealed and Unsealed Shoulders: Vegetation height is maintained in accordance with the contract specifications for the category of road.

Edge Marker and Signposts: The area surrounding edge marker posts and signposts, including culvert marker posts, is to be treated to provide vegetation control. Vegetation shall not exceed 150mm in height in the control area.

Bridge End Markers: The area surrounding bridge end markers at bridge abutments is to be treated to ensure clear driver visibility of the markers.

Guardrails, Sight-rails and Culvert Headwalls: The area surrounding guardrails, Sight-rails and culvert headwalls is to be treated to provide vegetation control. Vegetation shall not exceed 150mm in height in the control area.

Surface Water Channels, Side Drains and Culvert Waterways: All surface water channels, side drains, cut-out drains, and culvert waterways is to be treated to ensure the free flow of water, with growth height not exceeding 150mm. All culvert inlet and outlet drains are to be treated to the adjacent fence line or to a minimum of five metres from the culvert, whichever is the lesser.

Kerb and Channel, Road Furniture, Fence lines, Footpaths and Paved Areas: Any vegetation encroaching on, over, or around the kerb face, street and road furniture, or along unmaintained fence lines, or appearing in construction and defect cracks between kerbs, pavement, footpath, edge strip, barrier walls, the pavement itself, footpath and paved surfaces, or any other concrete structure, shall be removed.

Visibility and Road Hazards: Roadside vegetation which encroaches into the vegetation envelope or vegetation control area, as detailed in the contract appendices, shall be within the tolerances described.

Any other vegetation which presents a safety hazard to road users or operators of all vehicle types, by restricting visibility are to be removed.

Special width cut areas may be required for safety visibility on vertical and horizontal curves, intersections, railway crossings and at private vehicle crossings, where cut areas may extend to the legal boundary.

The contract specifies the type of herbicides permitted along with restrictions and exclusions relating to their use. Control of vegetation by the use of chemicals is carried out in accordance with all relevant Acts, regulations and Bylaws.

Berm Mowing: The mowing and trimming of berm areas, embankments and amenity areas is to conform to the standards for amenity mowing detailed in the contract specifications. Maximum vegetation heights vary from 200mm to 400mm depending on road hierarchy.

It is expected that property owners will mow berms in urban areas (typically in zones with a speed limit of 70kph or less) so these are a specific exclusion noted in the maintenance contract.

Vegetation Hazards: The Council's Request for Service (RFS) records sites where there are observed problems on the road network, such as fallen tree blocking the road. If clearance is more of a major undertaking, the road is practicable then permanent repairs or reinstatement is prioritised in the Councils forward works or rolling maintenance programmes.

Vegetation control is budgeted under NZTA Work Category 121 – Environmental Maintenance in the Council's Land Transport Programme.

Trees planted in the berm areas of urban streets are covered under the Parks and Reserves Maintenance Contract, administered by Council's Community Facilities Group. The removal of trees for safety is considered on a case by case basis based upon input from:

- The road maintenance contractor
- Council staff
- Community committees

Roadside Berms: Inventory details on berms are collected and stored in Council's RAMM database.

There are no formal maintenance or renewal programmes associated berm assets. Berms are renewed as a component of urban reconstruction projects but are not generally subject to renewal in isolation.

Berm maintenance occurs on an as needed basis and is carried out under the road maintenance contract. It is generally accepted that residents will mow and keep berms in a tidy condition, most residents are happy with this approach.

4.5 Disposals

This section describes how to identify and actively manage assets, which are no longer fit for purpose, and then to programme the most cost effective disposal or removal of those assets.

Disposal activities are associated with the removal from service of a redundant or surplus asset. Assets may become surplus for any of the following reasons:

- Under utilisation
- Obsolescence
- Provision exceeds required level of service
- Uneconomic to upgrade or operate
- Policy change
- Service provided by other means (e.g., private sector involvement)
- Potential risk of ownership (financial, environmental, legal, social, vandalism, etc)
- Advancements in technology which provide more cost-effective options

Item:	*Mitigation:*	*Relevant Standards:*
Disposal of Roads	The Council is not free to dispose of roading assets as it wishes. The principal controls on its ability to do so are: Section 342 of the Local Government Act 1974. This gives The Council authority to remove a road from the network and for title to it to be granted to the Council. The Council may then retain or dispose of the title. If a road is diverted or realigned, rather than being removed from the network, the provisions around road stopping may not apply.	Council Policy Road Stopping – Disposal of Surplus, which outlines the Council's minimum requirements for consideration of a request to stop a road.
Uneconomic Roads	Unformed legal roads are not maintained by the Council for roading purposes. Some roads have been classified as limited maintenance roads, and therefore receive only sufficient maintenance to provide a minimal level of service. The Council may agree on a case-by-case basis to maintain a road if it has been upgraded to a suitable standard by others at their cost, with its prior permission.	NZTA Planning, Programme and Funding Manual determines the provision of financial support for "uneconomic roading facilities".
Surplus Land	Land is usually declared surplus when: It has been Purchased under the Public Works Act for future road development Land designated as legal road is not required for roading purposes now or in the future When this process is requested, a case-by-case evaluation determines if there is strategic value in keeping the land for another transport purpose	
Disposal of Bridges Disposal Strategy	No decisions have been made on disposal of bridges. These will be considered when the need arises for substantial renewal works or replacement, considering all which are defined as "uneconomic" bridges as discussed earlier.	These sale processes must comply with the Local Government Act 1974.
Disposal of Footpath Disposal Plan Strategy	Before committing to the removal of any of path the Council will: Consult the people in the affected street or streets, Consult the relevant communities, and consider the recommendations of the relevant township committees. There are no current plans to dispose of any footpaths.	

5.0 Financial strategy

5.1 Identifying and categorising lifecycle costs

Council makes decisions on the acquisition and ongoing use of many different assets. The initial capital outlay cost is usually clearly defined and is often a key factor influencing the choice of asset given a number of alternatives from which to select.

The initial capital outlay cost is, however, only a portion of the costs over an asset's life cycle that needs to be considered in making the right choice for asset investment. The process of identifying and documenting all the costs involved over the life of an asset is known as Life Cycle Costing (LCC).

The total cost of ownership of an asset is often far greater than the initial capital outlay cost and can vary significantly between different alternative solutions to a given operational need. Consideration of the costs over the whole life of an asset provides a sound basis for decision-making. With this information, it is possible to:

- Assess future resource requirements (through projection of projected itemised line item costs for relevant assets)
- Assess comparative costs of potential acquisitions (investment evaluation or appraisal)
- Decide between sources of supply (source selection)
- Account for resources used now or in the past (reporting and auditing)
- Improve system design (through improved understanding of input trends such as manpower and utilities over the expected life cycle)
- Optimise operational and maintenance support (through more detailed understanding of input requirements over the expected life cycle)
- Assess when assets reach the end of their economic life and if renewal is required.

The Life Cycle Costing process can be as simple as a table of expected annual costs or it can be a complex (computerised) model that allows for the creation of scenarios based on assumptions about future cost drivers. The scope and complexity of the life cycle cost analysis generally reflects the complexity of the assets under investigation, the ability to predict future costs and the significance of the future costs to the decision being made by Council.

A life cycle cost analysis involves the analysis of the costs of a system or a component over its entire life span. Typical costs for a system may include:

- Acquisition Costs (or design and development costs)
- Operating costs
  - Cost of failures
  - Cost of repairs
  - Cost for replacement
- Maintenance costs
  - Cost of corrective maintenance
  - Cost of preventive maintenance
  - Cost for predictive maintenance

5.2 Developing long term financial forecasts

Long-term financial planning combines financial forecasting with strategising. It is a highly collaborative process that considers future scenarios and helps governments navigate challenges. Long-term financial planning works best as part of an overall strategic plan.

Financial forecasting is the process of projecting revenues and expenditures over a long-term period, using assumptions about economic conditions, future spending scenarios, and other salient variables.

Long-term financial planning is the process of aligning financial capacity with long-term service objectives.

Financial planning uses forecasts to provide insight into future financial capacity so that strategies can be developed to achieve long-term sustainability in light of the government's service objectives and financial challenges.

Council has a comprehensive long-term financial planning process because it stimulates discussion and engenders a long-range perspective for decision makers. It can be used as a tool to prevent financial challenges; it stimulates long-term and strategic thinking; it can give consensus on long-term financial direction; and it is useful for communications with internal and external stakeholders.

Council’s long-term financial plan includes these elements.

Time Horizon: The plan looks at 30 years into the future.

Scope: The plan considers all appropriated funds, but especially those funds that are used to account for the issues of top concern to elected officials and the community.

Frequency: Council updates long-term planning activities as needed in order to provide direction to the budget process, though not every element of the long-range plan is repeated.

Content: The plan includes an analysis of the financial environment, revenue and expenditure forecasts, debt position and affordability analysis, strategies for achieving and maintaining financial balance, and plan monitoring mechanisms, such as scorecard of key indicators of financial health.

The public and elected officials are able to easily learn about the long-term financial prospects of Council and strategies for financial balance. Hence, Council has an effective means for communicating this information, through separate plan documents and by integrating it with existing communication devices.

Disposal costs: A complete life cycle cost projection (LCCP) analysis may also include other costs, as well as other accounting/financial elements (such as, interest rates, depreciation, present value of money/discount rates, etc).

5.3 Developing funding plans

Balancing the Budget: Council is required by legislation and for prudent financial management to balance its budget. This means that operating expenses must be covered by operating revenues unless specific exemptions are detailed in this Financial Strategy. During the preparation of the Long Term Plan the balancing of the budget is done at an activity level. In the Financial Strategy Council has identified a number of circumstances where it is appropriate not to balance the budget.

Unfunded depreciation: Council uses depreciation to fund the renewal or replacement of assets. Council currently funds 49% of the depreciation on roading because the renewal or replacement of the majority of our roading assets are funded through subsidy from NZTA. Roading is a strategic asset of Council and results in a significant depreciation charge.

Revenue for capital purposes: The operating surplus in the Statement of Comprehensive Revenue and Expense includes revenue to fund capital expenditure. Through the life of the plan this type of revenue includes subsidy from NZTA for roading capital expenditure, development contributions received to cover growth related capital expenditure and contributions from ratepayer to fund the connection to Council infrastructures.

Funding from future development contributions for growth related capital expenditure: In determining our development contributions, a 50 year programme has been developed and development contributions were calculated over this time. Often, Council is required to put the infrastructure in place to ensure we have the capacity to accommodate growth in advance of the development. In these instances, loans are taken out to fund this expenditure. The servicing of these loans (both interest and principal repayments) is to be funded by future development contributions.

Funding From Prior or Future Years Surpluses: There are a small number of circumstances where it is considered prudent to fund operational expenditure from prior or future years' surplus.

Intergenerational Issues: Council manages many different assets. Roads, footpaths, pipes, drains, parks and reserves all require careful management to provide services to the community now and in the future.

Some assets are useful for a long time and provide service to more than one generation. For example, pipes and bridges often have an estimated life of 60 to 100 years.

When making financial decisions about how to fund assets, Council takes into account how today's decision will impact on current and future generations. Council considers that it is fair to expect those people who benefit from the service should pay for it. This principle assists Council to decide how to fund the costs of replacing existing assets and to build new assets. For example, long life assets may be partly funded by a loan. Loans spread the cost of the asset across current and future generations.

Funding Sources: Rates are a property tax set annually by Council. Rates are one source of income the Council uses to fund projects and operating services.

Council considers the affordability of the proposed rate requirements both for the Council and ratepayers. When setting rates Council considers:

- the levels of service provided
- intergenerational issues
- other sources of funds
- legislative requirements
- external factors
- what our ratepayers can afford

A minimal amount of investment income is generated by Council's investment in forestry assets, and this is used to offset general rates.

Borrowing: Council utilises external borrowing to fund the acquisition of assets. Council's Liability Management Policy governs the borrowing mechanisms and current limits.

Internal Borrowing: This is a mechanism available to manage both the level of funds available and external debt. This facility enables an activity to borrow from the Council treasury function as opposed to borrowing externally, with an appropriate interest rate charged.

Utilising internal borrowing enables Council to manage its cash/investment portfolio to take advantage of the moving margins between interest rate receivable and interest rates payable. Internal borrowing is used when external borrowing costs are higher than allowed investment returns.

Security for Borrowing: Many of Council's assets are not readily saleable so are less attractive as security items. Council will secure borrowings by a charge over our rating revenue either directly or through a debenture trust deed. Council will not secure other assets unless circumstances show it to be appropriate (e.g., leased assets).

Investments: Council is a risk-averse entity. Council will not undertake transactions where the level of return or benefit is dependent on an unacceptable level of risk. The Investment Policy expressly forbids any form of purely speculative activity.

Adequate liquid funds are to be kept to allow all expected payments to be made on the due date. Investment levels should ensure adequate funds are maintained so special funds and reserves are backed by suitable investments.

Expenditure Classifications: To assist in identifying the reason for expenditure and finding the most appropriate funding source, Council has four expenditure classifications. Classification reflects good practice and new legislative requirements for financial reporting.

Type of Expenditure	*Description*
Operational expenditure	Operating expenditure is the day-to-day costs associated with providing a service. It includes expenditure not linked to an asset. It includes work required to keep an asset operating at the required level
Capital – renewal expenditure	Renewal work is expenditure required to replace or refurbish an existing asset that will bring the asset back to the original service potential
Capital - new works to improve the service level	In meeting desired Council outcomes and working to achieve its vision, Council may invest in additional facilities and/or upgrade existing assets. There will be changing service level requirements because of new technology, changing legislative requirements and resource consent requirements
Capital - new works to accommodate growth	Capital expenditure to accommodate growth in resident population and business activity

Asset Management: Roading is funded through a partnership with Central Government through NZTA. Historically most standards were set by the Council within broad NZTA guidelines. A new system now sets national standards (One Network Road Classification) for each type of road. This may impact on the affordability of maintaining existing levels of service.

This strategy is not a completely new process for Council. Previous LTP processes and adopted LTPs have included infrastructure programmes that were forecast out 10 years. These were based on the Activity Management Plans (AMPs) that Council continually revised and improved in response to Council decisions, imposed standards and resource consent conditions, technology and demand changes, and condition assessments / maintenance work.

Funding of Capital Expenditure: Capital works expenditure can be funded from NZTA, targeted rates, subsidies, reserves (for example depreciation reserve), borrowing and development contribution. Where possible the first source of funding for non-subsidised capital expenditure that will be third party sources i.e., development contributions.

5.4 Asset Valuation

5.4.1 Valuation approaches

Road assets are infrastructure assets, defined as infrastructural systems that provide a continuing service to the community and are generally not regarded as tradable.

The valuations are based on accurate and substantially complete asset registers (see improvement plan) and appropriate replacement costs and effective lives. The prime asset register is the RAMM database. The asset registers record data to a sufficient component level to allow assets of different base lives to be valued separately. The database includes assets owned by other entities; these are identified by '*Asset Owner*' and are excluded from Council's asset valuation calculations.

Statutory financial reporting standards require MDC to revalue its plant, property and equipment where there has been a significant change in values, or at a maximum interval of three years. However, MDC chooses to value its assets on an annual basis regardless of the significance of changing values. This allows the council to better forecast increases in annual depreciation and helps to ensure there is an understanding of any significant changes resulting from changes to the asset stock or contractor rates. Significant changes in input parameters, that may have a material effect, may result in an earlier revaluation of assets.

- Asset valuation reports are externally peer reviewed on a 3-yearly cycle.
- Road assets are valued by Council staff and specialist consultants in accordance with the following standards: PBE IPSAS 17 Property Plant and Equipment International Accounting Standards.
- NAMS Infrastructure Asset Valuation and Depreciation Guidelines, Edition 2, 2006. In addition, the guidelines provided in the New Zealand Infrastructure Asset Valuation and Depreciation Guidelines Edition 2.0 2006 are followed.
- The valuation is subject to Audit. Asset quantities used for the valuations are those detailed in the Council's asset registers and databases.

The annual valuations calculate the following financial information at component level which is summarised by asset type in the reports:

- Optimised Replacement Cost (ORC)
- Optimised Depreciated Replacement cost (ODRC)

Annual Depreciation (AD)

The Council has adopted the depreciation method of calculating the change of service potential; where:

- Change service potential = Renewal expenditure - Annual depreciation
- Cumulative change in service potential 03/04 = change SP 02/03 + change SP03/04.

NOTE: The value of new improvements is not added into the equations in the years in which they are built, rather, their depreciation and ultimate renewal are considered in all subsequent years.

5.4.2 Calculating depreciated replacement cost

Most assets lose their value over time (in other words, they depreciate), and must be replaced once the end of their useful life is reached. Depreciation is a method of allocating the cost of an asset over its useful life. For example, as a bridge ages and comes to the end of its useful life it is worth less than when new.

Depreciation represents the charge to the current ratepayers for the use of the asset during each year. If operating costs, including depreciation, are not covered by operating revenues, it can be argued the current users of the service are not paying for the benefits they are receiving. Depreciation will be charged on all assets by allocating the cost/or valuation of the asset over the estimated remaining useful life of the asset.

Assets are regularly revalued (operational assets at least every three years and infrastructural assets annually) with the depreciation expense based on the revalued amount. This ensures the amount of depreciation reflects current market values.

As depreciation is a charge for the use of the asset by current users, Council has elected not to create individual depreciation reserves.

There are some assets depreciated in the balance sheet, but their depreciation is not included in the calculation of rates.

The proportion of depreciation on roading assets funded by the NZTA subsidy is also removed from the rating calculation. Currently Council receives 51% of the maintenance and renewal expenses on the majority of roading assets. Including this in our rating calculation would be funding the expense twice.

5.5 Valuation Summary

MDC has valued its transportation assets at component level as they are populated in the RAMM database on 1 July 2023:

Asset Type	*Component*	*Unit*	*ORC Value*	*ODRC Value*	Annual Dep.
Berm	Berm	m2	$9,528,417	$9,528,417	$-
Bridge	Bridge (Deck)	m	$184,355,692	$79,233,702	$1,845,636
	Bridge (Culvert)	m2	$58,769,498	$23,322,205	$592,710
Crossing	Crossing	Each	$8,421,940	$3,866,775	$112,562
Drainage	Drainage	m	$98,681,705	$35,114,246	$1,217,361
	Drainage Wall	Each	$601,646	$484,677	$14,405
Feature	Feature	Each	$77,705	$66,391	$1,066
Footpath	Footpath	m2	$38,918,186	$20,221,038	$705,575
	Footpath Pavement Layers	m2	$332,384	$322,617	$4,818
Island	Island	m2	$3,428,931	$740,189	$50,863
Marking	Marking (RRPM)	Each	$392,522	$65,420	$65,420
	Marking (Remark Costs)	LS	$305,300	$305,300	$305,300
Miscellaneous	Miscellaneous	Each	$983,456	$958,700	$15,543
Railing	Railing	m	$5,729,743	$2,801,584	$115,929
Retaining Wall	Retaining Wall	m2	$58,944,832	$48,027,201	$737,404
Shoulder	Shoulder	m2	$61,143,505	$8,371,088	$912,707
Sign	Sign	Each	$3,696,991	$1,302,615	$228,362
Streetlight	Streetlight (Bracket)	Each	$1,568,903	$460,379	$31,372
	Streetlight (Light)	Each	$1,777,625	$1,447,639	$75,335
	Streetlight (Pole)	Each	$5,141,982	$2,235,279	$104,973
SW Channel	SW Channel	m	$47,716,599	$9,558,397	$713,122
Traffic Facility	Traffic Facility	Each	$493,147	$268,410	$32,273
Treatment Length	Formation Rural O L	m3	$167,516,430	$167,516,430	$-
	Formation Rural O P	m3	$51,936,566	$51,936,566	$-
	Formation Rural S L	m3	$43,817,097	$43,817,097	$-
	Formation Rural S P	m3	$15,343,461	$15,343,461	$-
	Formation Urban	m3	$7,338,239	$7,338,239	$-
	Pavement 1st Coat	m3	$49,682,941	$13,701,811	$741,536
	Pavement R k-Depth	m3	$31,177,633	$24,799,018	$465,338
	Pavement R u-D <2000	m3	$95,443,551	$5,712,966	$1,424,531
	Pavement R u-D >2000	m3	$11,226,924	$691,439	$167,566
	Pavement U k-Depth	m3	$6,695,519	$5,469,985	$99,933
	Pavement U u-D <2000	m3	$11,246,443	$671,573	$167,857
	Pavement U u-D >2000	m3	$3,732,620	$222,843	$55,711
	Pavement Unseal	m3	$10,320,262	$10,320,262	$-
	Surface Structure	m3	$61,446,378	$24,134,558	$4,133,149
Total			*$1,157,934,773*	*$620,378,517*	*$15,138,357*

6.0 Risk management

Council is confident that the programme can be delivered, and risks managed. Council has a proven track record of sound delivery with previous investment in the continuous programme and related activities (particularly in terms of timing, alignment, and management of the funding allocation). Council has the capability and the capacity to deliver and manage the future programme and related activities, particularly in terms of adequacy of resourcing and skillsets available.

Council has identified its key risks for the type / complexity of the network (and/or related activities) and has a sound risk mitigation strategy in place.

6.1 Context

The Council is exposed to a number of risks arising from the operation of the road network. A Risk Register and Treatment Plan has been developed in alignment with AS/NZS ISO 31000:2009 Risk Management, Council's Corporate Risk Policy, and the RIMS Best Practise Guideline for Risk Management on Road Networks.

The figure below summarises the key steps of the risk management process specified in AS/NZS ISO 31000:2009 and as applied within its contracts. This process is a systematic approach applicable to all aspects of Council's Roading Activity delivery, from governance to task level activity.

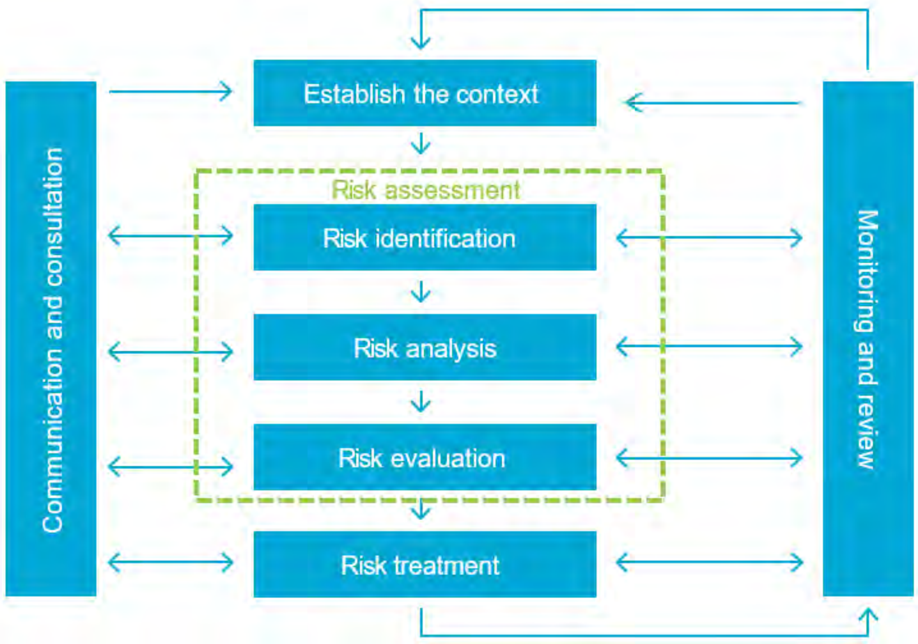


FIGURE 66: RISK MANAGEMENT PROCESS

Establishing the context for risk management is fundamental to its effective management. The context against which risks may be identified is likely to exist in the following:

- Political, economic, social, technological, legal and environmental change
- Client/contract objectives
- Client or supplier-initiated contract change
- Delivery programme
- Potential for failure to achieve Performance Indicators (PI's)

- Estimating assumptions or uncertainties
- Business, process, design or construction change
- Design outputs and assumptions
- Construction working methods
- Outputs from review/audit

6.2 Identification

The following risk identification techniques are utilised:

- **Checklists** | review of generic and/or activity specific risk themes
- **Workshops/reviews** | formal multi-disciplinary forums that take the form of either 'blue sky' thinking or focused review of existing data. Participants are selected based on attendance requirements relative to maximising outcomes from the degree of involvement and time spent
- **Interviews** | used on a selective basis to elicit information from specialist personnel
- **Experience-based reviews** | review of previous projects and/or contracts undertaken
- **Ad-hoc** | delivery team identification of risks during contract execution

The framework for transportation risk management considers the risk topics shown below.

Planning Risks

- Strategic planning
- Activity management planning
- Levels of service
- Natural event and environmental

Management Risks

- Systems/information
- People
- Financial

Delivery Risks

- Procurement
- Project management
- Contract management
- Communication

Physical Asset Risks

- Risks common to all assets
- Risks associated with specific asset types

6.2.1 Level of investment/programming of work

The Programme Optimisation process selects the right things to do at an appropriate level of investment i.e., not over capitalising or over investing in treatments for the level of service or economic/social value of a road. It is important to note that the programme chosen tries to balance risk, condition and cost/outcomes. If investment is reduced, Council will assume a higher risk for assets on the network. The identified programme is then implemented in the right way, at the right time and for the right price.

6.2.2 Demand forecasts

Growth and demand forecasting is inherently uncertain and involves many assumptions. The Manawatū District is expected to continue to experience steady growth between now and 2054. However, the forecasts for households, residential development, community demographics, and land use changes will vary if the growth that occurs is different to the forecast, as will the impact assumed based on these forecasts.

Council regularly reviews demographic and development trends as part of their 10-Year Plan process, through regular monitoring and reporting, as well as using various resources including data from Statistics NZ. Major projects and significant changes to levels of service are assessed against affordability annually through the Annual Plan process. Specifically for land use, the zoning of land and the activities permitted on land is managed through the District Plan Review, informed by expert advice and investigations.

The above processes will enable Council to respond to changes in the demographic characteristics and development of the district over time, including the prioritisation of projects and service delivery to meet the needs of the community.

6.2.3 Climate change and emergency events

For this AMP, it is assumed that the intensity and frequency of extreme weather events, such as flooding, drought or heavy snowfall, will increase as a result of climate change, in line with projections released by NIWA following the IPCC Sixth Assessment Report.

Future climate change is unpredictable as the factors that influence the climate are highly complex and only partially understood. It is difficult to make a definitive prediction on what the future climate will look like. It is possible that climatic changes in the Manawatū District are more extreme than predicted by NIWA based on the IPCC Sixth Assessment Report.

The financial impacts of more extreme climate change will be mitigated by ensuring adequate insurance cover and undertaking appropriate maintenance as a preventative measure. The Regional Council has undertaken major flood protection works (stop banks) for the lower Manawatū, the Kiwitea Stream and Ōroua River flood control scheme. These stop banks are designed to withstand the current 1% Annual Exceedance Probability (AEP) flood event, 1 in 100-year flood. Further, technology is always changing, and it is likely that new and cost-effective plant and materials will be available to meet some of the challenges in the future.

6.2.4 Emergency funding

Cyclone Hale and Gabrielle have caused significant damage in recent months within the district. Such events make the network vulnerable to closures and put communities at risk of isolation and injury. Due to the impact these unpredictable events have on the community, immediate action is required by Council. Council is responsible for emergency work and must reprioritise pre-allocated Asset Management funding to execute this emergency work. If council maintenance or renewal budgets are continuously spent on emergency works the existing infrastructure is at risk of deteriorating below the acceptable level of service, increasing risk to the community and the Council.

It is acknowledged that NZTA has an Emergency Fund which councils can apply for in an emergency event however, recently emergency funding applications to NZTA are taking months, and in some cases years, to be paid. Decisions and reimbursement of claims are still outstanding, impacting funding for other maintenance activities such as renewals that were previously allocated.

6.2.5 Forecast assumptions

Cost increases caused by inflationary pressures such as oil price increases can affect the ability to carry out all necessary work and stay within budget. Cost increases resulting from inflation cannot be written out of contracts, so all the Council's period contracts include them. Cost escalation adjustments are regularly applied to contract rates and prices.

6.2.6 NZTA co-investment

Council assumes that it will receive 51% of the cost of roading maintenance and renewal projects from NZTA over the 10-Year Plan, with the exception of Emergency works, which may attract a higher subsidy dependent on qualifying criteria.

State Highway street cleaning and some components of the urban drainage maintenance programme, which are subsidised at a co-investment rate of 30% of the total expenditure of street cleaning within 2m of the edge of carriageway is eligible for funding. The remaining 70% has to be fully funded by the Council. This is included in the financial forecasts.

The programme of work and the financial plan to fund this work have been prepared based on the indicative 2024 Government Policy Statement. This recognises that NZTA is operating in a constrained funding environment. The maintenance and renewals programmes have been held at minimum levels and linked to the ONRC levels of service to reduce the risk of work not being funded by NZTA.

6.2.7 Asset data knowledge

It is important to note that the underpinning data, used and maintained in available databases, can include degrees of error or uncertainty. This is mostly due to the origin of some data from less robust, often historic data sources. The Data Quality assessment obtained from the Transport Insights website shows that the data captured for MDC can be used with a high degree of confidence, shown in section 4.1 of Part A | Strategic Case.

However, there are gaps and lower levels of confidence within Council's asset register (RAMM) for roading assets which could influence financial forecasts. These gaps have also been identified, including recommendations to improve these. This increases the risk over/under budgeting for the funding period as accurate information about the MDC assets are unknown.

6.2.8 Asset life

Assumptions have been made regarding the expected life of the assets.

Currently the remaining useful life is assigned when assets are valued using a standard table relating to construction dates and type of construction. Specifically, remaining useful life (RUL) is based on the total useful life of the asset less the age. Improvement has been identified (particularly with regard to MDC's structures portfolio), so it is more aligned with condition rather than the construction date which is susceptible to inaccuracies. If improvement is deferred, the risk of over/under budgeting for each funding period increases where less accurate information about MDC assets are unknown.

6.2.9 Identifying critical assets

Risk management provides the foundation for critical infrastructure protection. The ability to effectively identify critical assets is a crucial first step to any risk management process. Ensuring that a critical infrastructure asset identification methodology is complete, reproducible, documented, and defensible it is essential to enable cross-sector comparisons. The scope, approach and evaluation method are variables that can contribute to meeting these requirements. While several methodologies have been proposed in literature, no current methodology meets all the requirements. An MCA decision making model that combines the strengths of existing methodologies is a promising approach as it can provide systematic solutions that address the gaps and challenges associated with critical infrastructure asset identification.

6.3 Evaluation

Risk evaluation is the process of comparing the results of the risk analysis with the risk criteria to determine whether the risk and/or magnitude is acceptable or tolerable. The Council will draw on the best practice principles outlined by NZTA to identify, analyse, evaluate, and treat risks. The Risk Management Process will develop a Risk Matrix of Likelihood (L) versus Consequence (C) which will allow the prioritisation of identified risk.

6.3.1 Likelihood scale

The likelihood (L) scale describes how likely or often an event is expected to occur. For physical assets, the likelihood of some events can be estimated by condition assessments. For other events such as natural disasters or political risks the likelihood of occurrence is more difficult to determine and probably even more difficult for non-technical people to understand e.g., the 1 in a hundred year flood.

The likelihood of occurrence and severity of consequences should be based on as much real data as possible; for example, local knowledge or recorded events such as maintenance records, weather events etc. Some analysis may be required for verification.

The prime objective of this process is to apply a set of likelihood criteria which are also reasonable within the context of land transport activities. The likelihood scales help identify how often a particular event is expected to occur.

The descriptors shown in Table 35 are provided as a guide to help rank the likelihood of occurrence of each risk.

TABLE 35: LIKELIHOOD SCALE

Score	*Likelihood*	*Descriptor*
5	Highly Probable	The event is expected to occur e.g., 80% chance within the next 12 months
4	Probable	The event will probably occur e.g., 25% chance within the next 12 months or once in 4 years
3	Possible	The event might occur e.g., 10% chance within the next 12 months or once in 10 years
2	Unlikely	The event will probably not occur e.g., 4% chance within the next 12 months or once in 25 years
1	Rare	The event is not expected to occur e.g., 1-2% chance within the next 12 months or once in 50+ years

6.3.2 Consequence scale

Consequences of an event are the impacts that it has on the social, environmental, or economic wellbeing of the community or Council. The consequence (C) scale is focused on a quantitative approach. Each of these risk areas are then assessed using the standard consequence levels, ranging from negligible to catastrophic.

Table 36 is a series of qualitative descriptors for levels of consequence for the key areas. They are not exhaustive but will help when considering the correct level with the view that Council is the Risk Owner.

TABLE 36: CONSEQUENCE SCALE

Score	*Consequence*	*Descriptor*
5	Severe	Death and/or catastrophic effect on environment that may take longer than a year to restore and cost more than $1,000,000. Regulator notification mandatory.
4	Significant	Life threatening injury or multiple injuries requiring admission to hospital and/or significant effect on environment that may take up to a year to restore and cost up to $1,000,000. Regulator notification mandatory.
3	Moderate	Injury requiring admission to hospital and/or effect on environment that may take 1-2 months to restore and cost up to $20,000. Regulator notification mandatory.
2	Minor	Minor illness or injury requiring medical treatment (e.g., first aid) and/or minor effect on environment that can be cleaned up. Any potential damage remediation likely to cost less than $5,000. Regulator notification unlikely to be required.
1	Negligible	Illness or injury that doesn't require medical attention. No adverse effect on environment and regulator notification not required.

6.3.3 Risk matrix

After the likelihood and consequence factors have been determined, the level of risk is calculated by multiplying the Likelihood of Occurrence and Consequence Rating together.

Risk = the likelihood of an event occurring x the consequence of such an event.

The seriousness of risk is best categorised as a function of Consequence and Likelihood and involves selecting the most appropriate combination determined using the most current information. Risk categories from Low to Extreme are shown using a 'traffic light' system in Figure 67 below.

Council's risk management process requires an initial and revised risk assessment to determine the risk rating. The matrix below shows how the Likelihood and Consequence scores are combined to yield a total risk score for an event.

		Consquence					
		Negligible	Minor	Moderate	Significant	Severe	Overall Risk
Likelihood	Highly Probable	5	10	15	20	25	Low
	Probable	4	8	12	16	20	Low-Medium
	Possible	3	6	9	12	15	Medium
	Unlikely	2	4	6	8	10	Medium-High
	Rare	1	2	3	4	5	High

FIGURE 67: RISK RATING MATRIX

When the assessment of risk is done without regard for any current risk mitigation or control method it produces the raw, untreated, or gross risk.

Once the gross risk has been established an assessment of the risk is completed to understand the existing mitigation / control methods. The risk is then re-assessed for likelihood and consequence, taking the current mitigation / control methods into account. This helps quantify the effectiveness of the controls and provide a residual risk rating.

6.4 Risk register

The Council is exposed to a number of risks arising from the operation of the road network. A Risk Register and Treatment Plan has been developed in alignment with AS/NZS ISO 31000:2009 Risk Management, Council's Corporate Risk Policy, and the RIMS Best Practice Guideline for Risk Management on Road Networks. The risks identified are shown in Table 37:

TABLE 37: RISKS

		Risk with current Controls										
Ref	*Risk Category*	*Risk Description*	*Source "Caused by"*	*Expected Consequences Impact "Consequences"*	*Risk Area*	*(L)*	*(C)*	*Rating*	*Controls*	*(L)*	*(C)*	*Rating*
R1	Planning	Observed population growth is slower than demand forecasts predicted	Demand forecast based on inaccurate assumptions	Impact on financial ability to maintain infrastructure. Lower population will increase cost per property of delivering LOS.	Service Delivery Financial Decision Making	3	2	M	Council regularly reviews census data and monitor population growth, adjust investment accordingly Develop a spatial plan to map population growth.	2	1	L
R2	Planning	Observed population growth is more rapid than forecasts predicted	Demand forecast based on inaccurate assumptions	Reduced LOS as additional demand is placed on infrastructure. Increased funding to service excess capacity	Financial Decision Making Service Delivery	3	3	M	Council regularly reviews census data and monitor population growth, adjust investment accordingly Develop a spatial plan to map population growth.	2	1	L
R3	Planning	The impact of climate change will be more severe than predicted	Climatic changes in the Manawatū District are more extreme than predicted	Increased Infrastructure repair costs. Decreased LOS and safety. Impact on wellbeing and satisfaction of the community.	Financial Decision Making Health and Safety	4	4	M-H	Ensuring adequate insurance cover. Identify and mitigate high risk areas Undertaking appropriate maintenance as a preventative measure.	2	4	M
R4	Management	The council will not receive emergency fund in a timely manner causing council to reprioritize budgets	Recently requests to NZTA for emergency funds are taking months, even years to be paid.	Without timely processing of emergency event funding, council will be required to reprioritize budget at the cost of maintenance which will result in a drop of LOS. Reduced safety due to declining asset conditions.	Financial Decision Making Service Delivery	4	4	M-H	Anticipate extreme weather events and therefore request an increased overall funding requests to provide a safeguard.	3	3	M
R5	Management	Cost escalations affecting affordability of necessary work.	Inflationary pressures such as material (streel, aggregate, etc) can affect the price of work	Increased cost to Councils. Unable to complete all necessary maintenance, renewals or rehabilitations I the FWP. Decreasing LOS. Increasing safety concerns.	Financial Decision Making Service Delivery	3	4	M-H	Budget monitoring and regular reporting. Careful contract (project) planning.	2	3	M
R6	Management	The total level of NZTA funding is reduced.	Changes to the NZTA funding model	Reduction in the level of funding will have a major impact of the council budgets and thus affordability of required maintenance and LOS. Decreasing ability to maintain and renew assets on the network will increase risk to Council. Increased customer dissatisfaction.	Financial Decision Making Service Delivery	2	5	M-H	The Council intends to maintain its awareness of any issues that impact on the level of NZTA funding. Funding for the changing needs and expectations of the community has been recognized in the 10-year plan.	1	5	M
R7	Physical Assets	Remaining useful life.	Due to limited data - useful life of an asset is more closely related to construction date rather than condition	Increased risk of over/under budgeting for the funding period as remaining useful life is unknown. Assets with declining LOS. Reprioritising funding to undertake unforeseen rehab/maintenance leaving less funding for FWP.	Asset & Project Management Service Delivery	4	4	M-H	Include condition assessments in as the key indicator of remaining useful life where possible.	2	4	M
R8	Management	General labour shortage, maintaining skills and abilities, maintaining local knowledge	Difficulty in attracting, remunerating and retaining key staff	Cost Impact. Impact on continuity of planning decisions making.	Service Delivery	3	4	M-H	Monitor labour market and work to maintain or enhance the working environment at MDC.	3	4	M-H
R9	Management	Managing Cash Flow	Not spending when budgeted causing cash flow issues	Increase costs.	Financial Decision Making Leadership and Governance including Reputation	3	4	M-H	Budget monitoring and regular reporting.	2	4	M
R10	Planning	Road closure due to incidents	Climate change events Accidents	Delays in planned projects. Costs to emergency fund. Environmental damage. Economic impact. Social Impact. Increase in safety risks. Disruption to journeys. Community Dissatisfaction.	Environment Asset & Project Management Service Delivery Management Leadership and Governance Reputation	4	5	H	Biennial review of agreed detours. Identify key routes, roads and areas prone to slips. Emergency response plan and process in place with contractors so community impact is reduced. Work with NZTA on accident hot spots Improvements take into account modern safe road design. Safety through maintenance and renewals.	2	5	M-H
R11	Planning	Not replacing depreciating assets	Funding	Reduction in asset value. Reduction in condition of asset. Reduction in service levels.	Asset & Project Management Financial Decision Making	3	5	M-H	Monitor impact on road roughness and condition. Investigate other external funding sources. Budget for condition assessments. Plan and undertake renewals.	2	5	M-H
R12	Operational	Changing vehicle needs	Increased usage of VDAM, 50 Max and HPM vehicles	Impact on bridges and road use and loads. Cost of upgrading bridges and key roads.	Asset & Project Management Service Delivery Financial Decision Making	3	4	M-H	Monitor changing requirements of SH. Regulate permitting through NZTA. Consolidate HV traffic to key routes.	2	4	M

7.0 Monitoring and review

The activity management team will monitor contract delivery and the identified risks on the register (in accordance with NZTA's minimum standard Z/44 – Risk management, Table 3.2). Risk owners will be responsible for ongoing monitoring and review of risks, the conduct and effectiveness of associated treatments and currency of related data. Council will be responsible for monitoring the content of the risk register to ensure currency of data and the identification and notification of risk owners needing to update data. Contract risk reviews will be conducted to ensure the ongoing validity of risks identified, exposure levels, and progress and effect of associated treatment actions. Risk reviews will be attended by members of the delivery team deemed appropriate by the activity management team to maximise outcomes.

7.1 Developing effective performance measures

Council addresses their Customer Levels of Service using the ONRC Performance Measures.

The focus shifts from technical solutions to customer outcomes, and because of this the performance measures do not prescribe specific operational tasks. There are three types of ONRC performance measures:

- Customer Outcome
- Technical Output
- Cost Efficiency

Together, they measure Council's efficiency and effectiveness at meeting the Customer Levels of Service. The Performance Measures are a key tool for Council when building its business cases for national funding.

The Transport Insights Performance Measures Reporting Tool specifically reports the One Network Road Classification (ONRC) and One Network Framework (ONF) measures, and is useful by Council to view its performance and compare performance with other Approved Organisations.

NZTA's transport data website publishes a range of financial and non-financial information related to the performance of its transport investments. This data is collected as part of a statutory annual achievement return process and is published as part of the agency's commitment to open government data. These tools were developed several years ago and are currently maintained with data updates only. NZTA keeps them under review and will remove any tools if they are no longer required. Most of the metrics reported are independent of ONRC or ONF measures.

Whilst NZTA supplied data is not specific to the ONRC or ONF measures, it has proven to be a useful information source over many years for roading engineers in particular.

The team responsible for transport data are heavily involved in Transport Insights decision making and its future management and governance through REG. As a result, the agency is well placed to understand if or when opportunities will arise for reducing the apparent duplication in systems and tools referred to.

To fully replace the transport data tools would require a significant expansion of the scope of Transport Insights. It is likely that the tools will be viewed as complimentary to each other for the foreseeable future.

7.2 Evaluating options and setting performance targets

As the evidence base grows, the ONF and its performance measures enable us to benchmark the performance of each RCA's network. Council is able to easily identify varying levels of customer outcome across the country, and inconsistency of costs.

The ONRC was designed to standardise the performance of our roads throughout New Zealand, aiming to address historical inconsistencies, and promote economic growth.

This can only be achieved if all RCA's are monitoring and measuring their roads with the same tools and standards consistently over time. These performance measures support that consistency and have been developed by subject experts from REG, a collaboration between Local Government New Zealand (LGNZ) and NZTA. When used with Transport Insights, they are a significant resource to help asset managers better understand their network and tell their investment story.

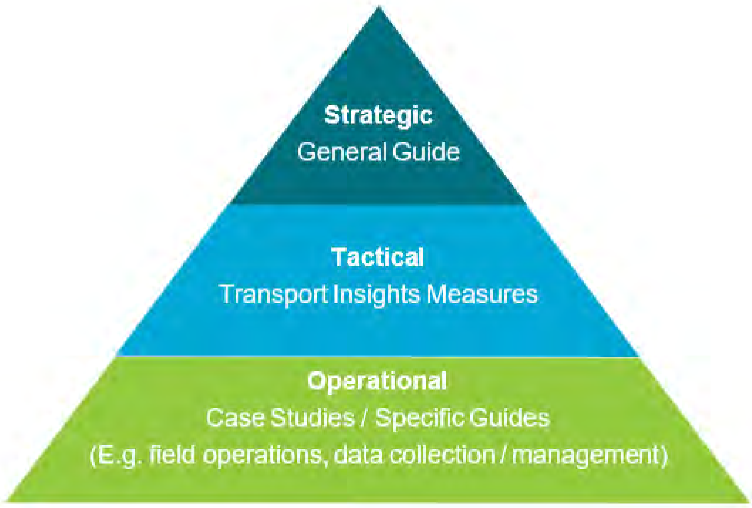


FIGURE 68: STRATEGIC, TACTICAL & OPERATIONAL CONTEXT

Council uses the performance measures when developing its business cases for the RLTP. The Performance Measures described above provides the strategic overview and context.

When using the performance measures, it is important to remember that while there is an element of compliance, they are intended to form the backbone of a thinking process. The measures complement and interact with each other. Council's investment story is derived by considering the data across the network and in the national context, rather than focusing on individual performance measures in isolation.

- Ensure CAS data is up to date in the RAMM database
- Results are compared nationally and against the peer group to determine trends within different classifications
- If the sample does not provide a true reflection of the wider network, then a larger sample area is audited
- Identify any actions to address contributing factors

8.0 Improvement plan

Improvement items are identified as general deficiencies that arise during the course of Asset Management and Contract Management activities. Other items can be determined through attendance at REG workshops, which identify regional and national improvement opportunities.

REG also provides a framework around Activity Management Improvement Planning, and has been developed using the following 6 pillars:

Systems	Evidence	Communicating	Decision Making	Service Delivery	People / Culture

Table 38 on the next 2 pages lists the improvement projects and service or data gaps, allocated to the relevant pillar:

TABLE 38: IMPROVEMENT PLAN

Project	Title	Activity	Current Status	Future Status and Identified Improvements	Improvement approach	Priority	Timeframe	Responsibility	Resources
SYSTEMS									
S1	Differential Level of Service (dLoS)	Incorporate the dLoS to improve national alignment and value for money linked to business systems.	dLoS being incorporated into the next round of MDC assessment frameworks. dLoS has been discussed but is still under development as some of the metrics have not been quantified.	Business / AMP systems fully integrated with dLoS definitions and use of performance measures.	Work collaboratively with other regional RCA's and NZTA. Review data sources to determine when information related to dLoS is available.	High	Dec-2026	Roading Manager	Senior Strategy Engineer - Roading, Asset Coordinator
S2	One Network Framework integration	Incorporate the ONF over and above the existing ONRC system to improve links to business systems.	ONRC incorporated into MDC data and is currently being used to report Transport Insights statistics. Aspects relating to performance measures for ONF awaited.	Business / AMP systems fully integrated with ONF classification and use of performance measures. All carriageways / other assets assigned to ONF.	Work collaboratively with other regional RCAs and NZTA. Review data sources to determine when information related to ONF is available. Maintain snapshot capability of Network's pavement and surfacing condition by continuing ONRC analysis in parallel, allowing a seamless switch to ONF for the next AMP / PBC.	High	Dec-2026	Roading Manager	Senior Strategy Engineer - Roading, Asset Coordinator
EVIDENCE									
E1	Asset condition status	Improve investment visibility to asset maintenance and renewal categories.	Identification of condition and programming of structures and other asset renewals limited by historical, short term, external contracting of activity.	Development and maintenance of a robust Structures, Footpath, Drainage and other maintenance / renewal programmes.	Manage, gather and adapt asset information to provide total network coverage on a rolling 10 to 30 year programme (as appropriate).	Medium	Ongoing	Senior Strategy Engineer - Roading	Roading Operations Manager Asset Coordinator
E2	Active transport facility	Encourage greater usage of active transport mode(s).	Non-cohesive data available for condition and re-purposing of assets to encourage active transport. MDC Walking & Cycling Strategy developed and reviewed by Community Facilities & Roading representatives.	An identified, objectively prioritised programme related to provision of walking and cycling facilities; relevant to findings of Resident Satisfaction Surveys, which aid in highlighting focus areas.	Maintain a minimum 10-year Forward Works Programme using the developed prioritisation matrix and Resident Surveys to identify and collate demand against service gaps within the district. Work collaboratively with interest groups, other RCA's and NZTA where necessary.	Medium	Ongoing	Community Spaces Manager	External Consultancy, Senior Strategy Engineer - Roading
COMMUNICATING									
C1	Communications plan development	Informing the public in a timely manner regarding proposed activities impacting the transport network.	Comms team expanded, providing resource to departments across Council. Ad hoc use of social media to highlight consultative (planned) and unplanned issues regarding the roading network to the public.	Identify activities requiring public action, engagement and/or consultation, developing tailored plans for each type of activity.	Continuous liaison and development of action plan(s) between Roading team and Comms team. Ability to issue early notification of consultative (planned), and urgent notification for response / unplanned, events/ activities impacting use of the road network.	Medium	Ongoing	Roading Manager, Communications Manager	Roading Manager, Senior Strategy Engineer - Roading, Policy Adviser, Communications Officer(s)
DECISION MAKING									
DM1	Emergency funding reserve	Financial resilience in managing emergency events.	Council has depleted its emergency fund reserve due to recent, numerous adverse weather events. Emergency works are undertaken using funding allocated to other work categories	Areas of the network identified where particularly vulnerable to climate change events. Reserve funding for emergency events, particularly climate change events.	Attend 'lifelines' regional meetings to maintain cognisance of environmental impacts and capabilities. Include Emergency funding reserve allocation in 2024-27 AMP / PBC and beyond.	High	Ongoing Jun-2024	Roading Manager	Executive Leadership Team (ELT), Elected members

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Project	Title	Activity	Current Status	Future Status and Identified Improvements	Improvement approach	Priority	Timeframe	Responsibility	Resources
DECISION MAKING									
DM2	Activity Management Plan improvement	**Incorporates development and management of:** The Speed Management Plan. The Procurement Strategy. Asset performance and service gap analysis capability. Levels of Service optimisation.	1st Speed Management Plan at consultation stage. Current Procurement Strategy endorsed. Development of some asset performance databases underway. Levels of service adjusted for new Road Maintenance Contract.	**Maintain updated:** Speed Management Plan. Procurement Strategy. Cognisance of network portfolio's asset performance. **Monitor effectiveness of:** Levels of service.	Review data sources to determine when guidelines and legislation related to AMP improvements are updated (i.e., SMP's and Procurement Strategies). Develop asset databases to identify gaps in - and track - asset performance trends.	Medium	Sep-2026	Roading Manager	Senior Strategy Engineer - Roading, Roading Operations Manager Asset Coordinator, ELT, Elected Members
SERVICE DELIVERY									
SD1	Maintenance contract	Procurement of new transport / roading contract(s).	Current contract period ends at the end of the final 3-year period (2021-2024)	New Contract to be procured for the next funding period (2024-2027) and beyond. Clear expectations of Contractor in maintaining the network at an appropriate Level of Service.	Integrate Levels of Service for road classifications between AMP and Road Maintenance Contract. Obtain internal approvals and develop productive working relationships with Organisation awarded the Contract (tba).	High	Jun-2024	Roading Manager	Roading team, ELT, Elected members
PEOPLE / CULTURE									
P1	Regional collaboration	Regional collaboration is continued to be developed and new opportunities identified.	Collaboration and development of previous, combined AMP's.	Continue to work together with shared improvement opportunities for AMP development. Identify further collaborative opportunities	Participating in regional transport meetings / workshops / forums to promote collaboration, involving RCA's and NZTA.	High	Ongoing	Roading Manager	Senior Strategy Engineer - Roading
P2	Capability plan	Development of a staff capability and succession plan.	No plan in place.	Review individual RCA plans (if available) and identify any gaps.	Individual RCA capability matrix of core competencies developed. Gaps identified and action plan developed.	Medium	Jun-2024	Roading Manager	HR department, Roading team

Appendix 1 - Full Multi-Criteria Analysis

Maintenance

Asset Group	Funding Level	Asset Quantity	Resilience	Resilience	Condition	Condition	Safety	Safety	Customer satisfaction	Customer satisfaction	Service Delivery	Service Delivery	Financial Impacts	Financial Impacts	Overall Score	Overall Impact	Residual Risk
WC111 | Sealed pavement	Increased	$3,852,718	Increase in funds will have a minimal impact on the overall resilience of the network	🟡	Increase in funds will ensure maintenance of overall condition of sealed pavements throughout the network. Additional investment is will ensure appropriate response timeframes to quantity and severity of reported defects	🟢	Increase in investment will aid in safety outcomes	🟢	A Increase in funds will provide customers with a better maintained sealed roads, improving the overall customer satisfaction.	🟢	Potential resource constraints in NZ may impact service providers ability deliver an increased programme of works	🔴	Additional investment in sealed pavements will aid in maintaining current pavement performance and maximising pavement life	🟡	67%	🟡	Medium
	'As is'	$3,600,671	Maintenance on sealed pavements will have a minimal impact on improving overall network resilience	🟡	'As is' investment in sealed pavements will see a reduction in network condition, by being less able to repair potholes, surface cracking in a timely manner	🔴	Investment in sealed pavements will aid in safety outcomes for the network, but may limit ability to respond to impacts from increasing road rideability	🟡	Bad road maintenance is one of the most common complaints in MDC. Therefore, maintaining investment in sealed pavements will not necessarily provide the community with a satisfactory network	🟡	Pavement maintenance will be in line with previous contracts. Therefore, service providers will likely be able to deliver the resultant quantum of work	🟡	Maintaining funding at present levels will see a reduction in condition, and increased future demand in investment to rectify	🔴	33%	🔴	
	Reduced	$3,096,577	Decrease in funds will have a minimal impact on the overall resilience of the network	🟡	Decrease in funds will limit ability for proactive activities (i.e., pre-seal repairs) and reactive activities (response to - and mitigation of - potholes, etc), resulting in poorer road condition	🔴	Decrease in funds will have minimal impact on overall network safety. General maintenance will allow infrastructure to maintain the same level of safety	🟡	Decrease in maintenance funds on sealed pavements will have a negative impact on customer satisfaction	🔴	Reduced funding will reduce resource requirement and produce a limited programme. This will fail to address as many defects, but will be easier to manage	🟢	A reduction in investment will result in accelerated deterioration and exponentially larger future costs to rectify	🔴	33%	🔴	
Comments	Failure to increase funds to compensate for network deterioration and increasing traffic volumes will result in a poorer road user experience and increased costs to other work activities																
WC112 | Unsealed pavement	Increased	$2,854,069	Increase in funds will have a minimal impact on the overall resilience of the network when compared to the 'as is' scenario	🟡	Increase in funds will improve the overall condition of the sealed pavements throughout the network. Increasing funds aids capability in logging activity mitigation	🟢	Increased investment will have a minimal impact on safety outcomes for unsealed roads	🟡	A Increase in funds will provide customers with a stable maintenance regime, managing customers expectations	🟡	An increased unsealed maintenance programme may attract greater economy of scale and resultant efficiencies for Council	🟢	Additional investment in unsealed pavements will maximise pavement life	🟢	75%	🟡	Medium
	'As is'	$2,503,570	General maintenance on unsealed pavements will maintain overall network resilience	🟡	General funds allocated to unsealed pavements is sufficient to complete repairs to the unsealed network. Repairs such as potholes and scouring can be carried out on current timeframes	🟡	Maintained investment will have a minimal impact on safety outcomes for unsealed roads	🟡	Bad road maintenance is one of the most common complaints in MDC. Therefore, this investment level is likely to see less satisfaction in the community	🔴	Pavement maintenance will be in line with previous contracts. Therefore, service providers will continue to operate as BAU	🟡	No impact to investment demand, but level of service may be reduced	🟡	42%	🔴	
	Reduced	$2,077,963	Decrease in funds will have a minimal impact on the overall resilience of the network when compared to the 'as is' scenario	🟡	Decrease in funds will likely have a negative impact on road condition	🔴	Decrease will not have a major impact on the safety of the network	🟡	Decrease in maintenance funds will have a negative impact on customer satisfaction	🔴	Decreasing maintenance will require less resource, but may impact on obtaining resource to deliver smaller programme(s) of work in an efficient manner	🟡	Decrease in unsealed pavement maintenance may be beneficial in the short term, but will demand more expensive pavement reinstatement activities in future	🟡	33%	🔴	
Comments	Failure to increase funds to address increasing customer complaints regarding road condition will result in a poorer road user experience and increased costs to other work activities to compensate																
WC113 | Routine drainage	Increased	$1,607,184	Minimal increase in funding will maintain the existing resilience of the network, but will better provide for resource to focus on 'hot-spots' and improve overall capacity	🟡	Increase in routine drainage maintenance would aid in maintaining the condition of Council's asset portfolio	🟡	Increase in routine drainage funds will have a positive impact to safety above existing (i.e., by reducing exposure to ponding on carriageways)	🟢	Targeting' hot-spots' to improve resilience will improve customer service by reducing the frequency that drainage asset capacities are exceeded (i.e. ponding to carriageways)	🟢	An increased unsealed maintenance programme may attract greater economy of scale and resultant efficiencies for Council	🟢	Investment for routine drainage will result in a minimal financial impact over the 'as is' scenario in the short to medium term. The quantity and nature of assets are expected to remain similar	🟡	75%	🟡	Low-Medium
	'As is'	$1,461,076	Current investment levels will maintain the existing resilience of the network	🟡	As is' funds in routine drainage will have minimal short-term impact on condition of the network	🟡	General routine drainage funds will have a neutral impact on overall network safety	🟡	Routine drainage funds will provide sufficient, but limited treatments in satisfying customers	🟡	Routine drainage funding in line with previous contracts will likely be delivered to the same level of service as existing	🟡	Maintaining investment in drainage will provide sufficient value for money, as maintenance of assets is an essential service	🟡	50%	🟡	
	Reduced	$1,431,855	Decreasing funds will negatively impact network resilience, by reducing both: Capability of the Contractor to respond to, and capacity of assets to handle adverse weather events	🔴	Decrease in funds will impact overall network condition	🔴	Decrease in routine drainage treatments will have minimal impact on safety in the short term	🟡	Decreasing routine drainage maintenance will have a negative impact on customer service	🟡	A decrease in funding will reduce complexity in the programme, resulting in 'successful' achievement, **but it will be against a lower level of service**	🟢	Decreasing investment in routine drainage will have a negative impact on drainage asset performance, resulting in additional monies being required to rectify issues	🔴	33%	🔴	
Comments	Whilst both 'as is' and 'increased' funding levels result in a neutral impact to the network, increasing adverse weather events will demand greater capacity and performance from assets in the future. Increased funds will mitigate this issue more effectively than keeping funding levels as they are																
WC114 | Structures maintenance	Increased	$1,015,157	Increase in funding will have a minimal impact on resilience	🟡	Increase in routine structures maintenance would aid in maintaining the condition of Council's asset portfolio	🟢	Increase in funds will have a positive impact in safety above existing (i.e., by improving visibility of components to road users)	🟢	Minimal impact	🟢	An increased unsealed maintenance programme may attract greater economy of scale and resultant efficiencies for Council	🟢	Investment will result in a minimal financial impact over the 'as is' scenario. The quantity and nature of assets are expected to remain similar	🟡	83%	🟢	
	'As is'	$966,816	Current funding levels will have a minimal impact on resilience	🟡	As is' funding for routine structures maintenance will have minimal short-term impact on condition of the network	🟡	Maintaining fund levels will have a neutral impact on overall network safety	🟡	Minimal impact	🟡	Funding in line with previous contracts will likely be delivered to the same level of service as existing	🟡	Maintaining investment will provide sufficient maintenance of assets	🟡	50%	🟡	
	Reduced	$928,143	Decreased funding will have a minimal impact on resilience	🟡	Decreasing funds will have a minimal impact in the short to medium term	🟡	Decreasing funds and subsequent treatment capability will have a negative impact on safety	🔴	Minimal impact	🟡	A decrease in funding will reduce complexity in the programme, resulting in 'successful' achievement, **but it will be against a lower level of service**	🟢	Decreasing investment in routine drainage will have a minimal negative impact on asset performance in the short to medium term	🟡	50%	🟡	Medium
Comments	A reduction in structure maintenance funding from 'as is' is acceptable, given the identified activities in the updated Lifecycle Structures Management Plan (LCMP) for this funding period. This reduction will assist in offsetting more pressing demands from other parts of the network																
WC121 | Environmental maintenance	Increased	$4,074,779	Increased funding aids management of vegetation where it may impact on carriageways due to adverse weather events	🟢	Minimal impact on condition of assets	🟡	Increase in funds will aid in managing height of (and visibility around) vegetation at key risk locations	🟢	Capacity to minimise - or respond to - vegetation and minor slips impacting on the corridor is increased, resulting in maintaining customer expectations	🟡	An increased maintenance programme may attract greater economy of scale and resultant efficiencies for Council	🟢	Increase in expenditure required to maintain performance; asset value and life will not see significant improvement (benefits are intangible, relating to safety and satisfaction)	🔴	67%	🟡	Medium
	'As is'	$3,772,944	Maintained funding will see gradual reduction in continuous network accessibility	🟡	Minimal impact on condition of assets	🟡	No impact on existing safety levels	🟡	Customer satisfaction likely to reduce if funding maintained at present levels	🔴	Funding in line with previous contracts will likely be delivered to the same level of service as existing	🟡	Minimal impact to existing funding level	🟡	42%	🔴	
	Reduced	$3,395,649	Reduced funding increases risk of limiting access on corridors due to partial of full blockages	🔴	Minimal impact on condition of assets	🟡	Decreasing funding will increase duration between rounds, heightening risk of reduced visibility for road users	🔴	Decreased funding restricts response and management of environmental issues, resulting in lower customer satisfaction	🔴	A decrease in funding will reduce complexity in the programme, resulting in 'successful' achievement, **but it will be against a lower level of service**	🟢	Asset value(s) unaffected by reduction in funding	🟢	42%	🔴	
Comments	Failure to increase funds to address increasing customer complaints regarding vegetation and slip management will result in a poorer road user experience and increased costs to other work activities to compensate																
WC122 | Network service maintenance	Increased	$1,731,565	Minimal impact on resilience	🟡	Increase in funding will aid maintenance of the asset portfolio	🟢	Maintenance of traffic services directly influences ability of road users to comprehend relevant information and act accordingly. Increased funding will aid in maintaining existing and new assets	🟡	Increased funding to respond to defects and manage traffic services will maintain customer satisfaction	🟡	Potential resource constraints in NZ may impact service providers ability deliver an increased programme of works	🔴	Increase in expenditure required to maintain performance; asset lives can be maximised	🟢	58%	🟡	Medium
	'As is'	$1,633,551	Minimal impact on resilience	🟡	Existing funding levels will see a reduction in overall condition over time, as individual assets are not maintained as frequently	🟡	Existing funding will see a reduction in condition of services and ability to respond to observed defects	🔴	Possible, but minimal impact to customer satisfaction in the short to medium term	🟡	Maintenance will be in line with previous contracts. Therefore, service providers will likely be able to deliver the resultant quantum of work	🟡	Minimal impact to existing funding level	🟡	42%	🔴	
	Reduced	$1,617,216	Minimal impact on resilience	🟡	Reduced funding will result in traffic services assets reducing in condition	🔴	Reduced funding will result in greater risk to road users failing to act on safety critical information	🔴	Reduced quality of signage, and delayed response to defects will frustrate customers, reducing satisfaction	🔴	Reduced funding will reduce resource requirement and produce a limited programme. This will fail to address as many defects, but will be easier to manage	🟢	Reduction in maintenance and response will reduce asset lives, increasing costs when renewing said assets	🔴	25%	🔴	
Comments	Failure to increase funds to address increasing customer reports of damaged and sub-standard signage condition will result in a poorer road user experience and increased costs to other work activities to compensate																
WC125 | Footpath maintenance	Increased	$223,343	Minimal impact on resilience	🟡	Improvement of asset portfolio condition can be realised if funding is increased	🟢	Safety for non-motorised road users maintained	🟡	Increased funding to respond to defects and manage path quality will aid in maintaining customer satisfaction	🟡	An increased maintenance programme may attract greater economy of scale and resultant efficiencies for Council	🟡	Minimal increase required to manage existing condition of assets; no change to asset lives anticipated	🟡	58%	🟡	
	'As is'	$221,132	Minimal impact on resilience	🟡	Slight reduction to asset portfolio condition	🟡	Risk of trips, slips and falls increases if response times and consequent levels of service are reduced	🔴	Possible, but minimal impact to customer satisfaction in the medium term	🟡	Funding in line with previous contracts will likely be delivered to the same level of service as existing	🟡	Existing funding levels will result likely result in a gradual reduction in condition, but minimal impact on asset lives	🟡	42%	🔴	
	Reduced	$77,396	Minimal impact on resilience	🟡	Reduced performance as a consequence of lower funding expected	🔴	Risk of trips, slips and falls increases if funding is reduced	🔴	Reducing ability to respond to defects will increase dissatisfaction with path quality	🔴	A decrease in funding will reduce complexity in the programme, resulting in 'successful' achievement, **but it will be against a lower level of service**	🟢	Reduced funding will see renewal costs increasing to compensate for lack of maintenance	🔴	25%	🔴	High
Comments	A minor increase in funding level above 'as is' would have maintained the network condition and customer satisfaction more effectively, given the high profile that defects to the walking network garner from path users; programme severely curtailed																

Renewals

Asset Group	Funding Level	Asset Quantity	Resilience	Resilience	Condition	Condition	Safety	Safety	Customer satisfaction	Customer satisfaction	Service Delivery	Service Delivery	Financial Impacts	Financial Impacts	Overall Score	Overall Impact	Residual Risk
WC211 | Unsealed roads metaling	Increased	$965,100	Increase in funds will improve the overall network resilience by accommodating less severe weather events	🟢	Pavement condition maintained at acceptable levels more frequently with increased funding, particularly when mitigating forestry activity	🟢	Whilst there are minimal safety issues raised on the unsealed network as a whole, adequate pavement performance will maintain user comfort and consistency	🟡	Increased funding will aid in managing customer expectations of road quality and performance	🟡	An increased maintenance programme may attract greater economy of scale and resultant efficiencies for Council	🟡	Additional investment in pavement management and resheeting will aid in maximising pavement life	🟢	75%	🟡	Medium
	'As is'	$831,983	Existing funding levels will likely see a minor increase in disruptions to network access	🟡	Existing funding levels will see a reduction in overall condition over time, as individual assets are not maintained as frequently	🟡	Whilst there are minimal safety issues raised on the unsealed network as a whole, existing funding will result in slightly reduced user comfort and consistency	🟡	Bad road maintenance is one of the most common complaints in MDC. 'as is' investment will supply MDC with a consistent, but lower level of service to customers	🟡	Maintenance will be in line with previous contracts and is likely to remain deliverable	🟡	Maintaining funding at present levels will see a reduction in condition, and increased future demand in investment to rectify	🟡	50%	🟡	
	Reduced	$807,023	Decrease in funds will see overall network resilience impacted due to inability to manage low level natural weather events	🔴	Decrease will reduce performance and require increased remedial activities from other work categories	🔴	Reduced funding will curtail ability to respond to pavement failures and reports of slippery conditions, resulting in increased risk to road users	🔴	Customer satisfaction will reduce if funding is decreased	🔴	Decreasing maintenance will require less resource, but may impact on obtaining resource to deliver smaller programme(s) of work in an efficient manner	🟡	A reduction in investment will result in accelerated deterioration and exponentially larger future costs to rectify	🔴	8%	🔴	
Comments	Whilst both 'as is' and 'increased' funding levels result in a neutral impact to the network, increasing adverse weather events will demand greater capacity and performance from assets in the future. Increasing funding will mitigate this issue more effectively than keeping funding levels as they are																
WC212 | Sealed road resurfacing	Increased	$12,360,321	Minimal impact on resilience	🟡	A increase will maintain the physical condition of the network	🟡	Maintaining the length of network that can be treated to provide adequate skid resistance will aid in improving safety	🟡	Minimal impact on customer satisfaction	🟡	Programme quantity would exceed existing, historic quantities	🟢	Maintaining a sufficient programme will reduce long term costs and the requirement to renew pavements	🟢	67%	🟡	
	'As is'	$11,236,656	Minimal impact on resilience	🟡	Existing investment levels in sealed renewals will no longer be adequate to maintain network condition	🟡	Reduced quantity of activity will result in greater portions of the network experiencing slippery condition	🔴	Minimal impact on customer satisfaction	🟡	Programme quantity is commensurate with existing, historic quantities, minimal impact anticipated	🟡	Maintaining a sufficient programme will reduce long term costs and the requirement to renew pavements	🟢	50%	🟡	
	Reduced	$9,775,890	Minimal impact on resilience	🟡	Decreasing investment will result in condition of the network reducing	🔴	Decreasing funds will result in increased risk to road users, particularly in adverse weather conditions	🔴	Minimal impact on customer satisfaction	🔴	Reduced funding will reduce resource requirement and produce a limited programme. This will fail to address as many defects, but will be easier to manage	🔴	Decrease in funds will provide a lower overall network performance and higher future demand as a consequence	🔴	8%	🔴	High
Comments	Failure to match fund the new Road Maintenance Contract rates to address deterioration of the sealed network condition will see greater risk imparted to road users and adverse consequences realised, such as suffering more serious and fatal injuries																
WC213 | Drainage renewals	Increased	$1,708,469	Increased investment into drainage renewals will improve resilience capacity to weather storm events	🟢	Increased funding at this stage will mitigate aging asset portfolio and minimise future expenditure	🟢	Investment will not improve network safety	🟡	Investment will positively influence customer perception if renewals are targeted to 'hot-spots' to deal with network disruption	🟢	Due to resource constraints in NZ, Increasing programme quantity may impact service providers ability deliver programme.	🔴	Lower long-term costs will be realised if an increased programme is implemented now	🟢	75%	🟡	Low-Medium
	'As is'	$1,525,418	Existing funding will make no change to network capacity, but with increasing storm events, disruption is likely to increase	🟡	as is' investment in drainage renewals will maintain overall condition of the network	🟡	Investment will not improve network safety	🟡	Investment at this level will not improve customer satisfaction	🟡	Maintaining funding levels will reduce complexity in the programme, resulting in 'successful' achievement, but may result in network disruption	🟡	Maintaining existing funding levels will see lower costs in the short to medium term, but opens the door to dramatic cost increases longer term	🔴	42%	🔴	
	Reduced	$1,372,877	Decrease in drainage renewals will likely see increased disruption to the network due to lack of capacity	🔴	Decreased investment in drainage renewals will lead to a backlog of works and cost spike in future years	🔴	Investment will not improve network safety	🟡	Reduced investment will likely see increased dissatisfaction with network performance	🔴	Reduced funding will reduce resource requirement and produce a limited programme. This will fail to address as many defects, but will be easier to manage	🟢	Reducing funding will lead to prohibitive costs or significant service reductions in future	🔴	25%	🔴	
Comments	Failure to invest in drainage assets to a) compensate for more frequent and severe weather events, and b) replace culverts, etc that have come to the end of their life will cause greater disruption to network access and increased customer dissatisfaction																
WC214 | Sealed road rehabilitation	Increased	$5,147,680	Minimal impact on resilience	🟡	Pavement condition deterioration will be reversed in quick order with increased funding	🟢	Minimal impact on safety	🟡	Slight improvement in customer satisfaction may be achieved with an increased programme	🟡	Potential resource constraints in NZ may impact service providers ability deliver an increased programme of works	🟡	Maintaining a sufficient programme will reduce long term costs and address increasing traffic volumes	🟢	67%	🟡	
	'As is'	$4,289,733	Minimal impact on resilience	🟡	Existing funding levels will likely maintain current network pavement performance	🟡	Minimal impact on safety	🟡	Bad road maintenance is one of the most common complaints in MDC. 'as is' investment will supply MDC with adequate pavements throughout the district	🟡	Programme quantity is commensurate with existing, historic quantities, minimal impact anticipated	🟡	Existing funding will assist in maintaining an adequate programme in the short term	🟡	50%	🟡	
	Reduced	$2,411,500	Minimal impact on resilience	🟡	Decreased funding will likely result in a rougher, more patched network	🔴	Minimal impact on safety	🟡	Decreased funding will likely result in lower customer satisfaction	🔴	Reduced funding will reduce resource requirement and produce a limited programme. This will fail to address as many defects, but will be easier to manage	🟢	Reducing funding will create a backlog of renewals, rapidly increasing cost if not managed adequately	🔴	33%	🔴	High
Comments	Failure to match fund the new Road Maintenance Contract rates to address deterioration of the sealed network condition will see greater risk imparted to road users and adverse consequences realised, such as suffering more serious and fatal injuries																
WC215 | Structures component replacements	Increased	$2,737,800	Increase in investment could provide the network with improved resilience against natural disasters	🟢	Replacing components with increased funding would improve the overall portfolio condition	🟢	Minimal impact on safety	🟡	Minimal impact on customer satisfaction	🟡	Due to resource constraints in NZ, Increased programme(s) may significantly impact service providers ability to deliver	🔴	Increase will not likely provide a significant performance improvement over and above the 'as is' scenario	🟡	58%	🟡	
	'As is'	$2,401,579	Investment in structural component replacements as per the recommended programme will maintain resilience with treatments such as steel protection, joint refurbishment and inspection programmes	🟡	Investment at recommended LCMP levels would maintain condition performance of assets	🟡	Minimal impact on safety	🟡	Minimal impact on customer satisfaction	🟡	Maintenance will be in line with previous contracts and is likely to remain deliverable	🟡	Investment at recommended LCMP levels would maintain a manageable investment profile	🟢	58%	🟡	Medium
	Reduced	$1,657,090	Decreasing funding may impact performance and resilience capacity	🟡	Decreasing the budget would result in significant condition issues for critical structural elements and severely shortened asset lives	🔴	Minimal impact on safety	🟡	Minimal impact on customer satisfaction	🟡	Reduced funding will reduce resource requirement and produce a limited programme. This will fail to address as many defects, but will be easier to manage	🟢	Decreasing funding will likely cause a spike in demand for renewals in the medium to long-term	🔴	42%	🔴	
Comments	Both the 'as is' and 'increased' funding levels score equally. The 'as is' programme will provide the correct level of investment for structural component replacements, as identified in the updated Lifecycle Structures Management Plan (LCMP) for this funding period																
WC216 | Bridge and structure renewals	Increased	$9,040,938	The increased investment will allow for renewal of additional assets, improving network resilience	🟢	Increase in structural renewals will improve the overall condition of the network	🟢	Increased replacement of assets to current standards will positively impact road user safety at key risk locations	🟢	Minimal impact on customer satisfaction over and above 'as is' scenario	🟡	Due to resource constraints in NZ, Increased programme(s) may significantly impact service providers ability to deliver	🔴	Over renewal of key structural assets such as bridges may improve condition on the network, but will impact on immediate demand	🟡	67%	🟡	
	'As is'	$6,746,969	Investment will have provision for the replacement of old bridges and other structures which will maintain network resilience	🟡	Investment in structural renewals will maintain overall condition of the network in line with recommended LCMP	🟢	Replacement of assets to current standards will improve safety for road users	🟢	Maintained renewal programme(s) will have limited impact on customer satisfaction	🟡	Maintenance will be in line with previous contracts and is likely to remain deliverable	🟡	Timely renewal of key structural assets will improve condition on the network and require less maintenance in future years	🟢	75%	🟡	
	Reduced	$0	The decreased investment will reduce the number of assets that can be renewed, increasing pressure on network resilience	🔴	Decreasing funding will likely reduce overall condition of the network	🟡	The reduced investment could reduce the level of investment in safety on structures decreasing the safety for users	🔴	Reduced investment may see increased dissatisfaction with incumbent asset performance	🔴	Reduced funding will reduce resource requirement and produce a limited programme. This will fail to address as many defects, but will be easier to manage	🟢	Reducing renewal of key structural assets such as bridges will decrease condition on the network, resulting in more maintenance	🟡	33%	🔴	High
Comments	Whilst both the 'as is' and 'increased' funding levels result in neutral impact to the network as this time, the 'as is 'programme will provide the correct level of investment for bridge renewals, as identified in the updated Lifecycle Structures Management Plan (LCMP) for this funding period																
WC222 | Traffic services renewals	Increased	$1,542,959	Investment will not impact resilience	🟡	Increased investment is required to counter cost inflation and additional short life assets being deployed on the network	🟡	Renewal of traffic services required to maintain safety of road users	🟡	Timely renewal of assets will reflect in maintaining level of satisfaction	🟡	Programme quantity is commensurate with existing, historic quantities, minimal impact anticipated	🟡	Increased funding required to maintain assets (particularly road markings) at an acceptable level	🟡	50%	🟡	Low-Medium
	'As is'	$1,390,054	Investment will not impact resilience	🟡	Current funding will see deterioration of assets on the network	🔴	Current funding will limit ability to adequately renew assets in a timely manner	🔴	Existing funding will result in lesser renewals and poorer condition, reducing customer satisfaction	🔴	Maintaining funding levels will reduce complexity in the programme, resulting in 'successful' achievement, **but it will be against a lower level of service**	🟡	Existing funding will not achieve sufficient delivery of required level of service, but will deliver a reduced LoS	🟡	25%	🔴	
	Reduced	$1,251,048	Investment will not impact resilience	🟡	Reducing funding will require lower levels of service and consequent decreasing asset condition	🔴	Reducing funding will severely constrain renewal capability and will result in increased risk to road users	🔴	Reduced investment will cause customer satisfaction to reduce as well	🔴	Reduced funding will reduce resource requirement and produce a limited programme. This will fail to address as many defects, but will be easier to manage	🔴	Decreased funding will cause significant issues that will require subsequent, additional investment to compensate	🔴	8%	🔴	
Comments	Traffic Services Renewals provides vital treatments for 3 important safety aspects of the network - signage, lighting and road marking. Failure to increase funds to compensate for higher material costs and deliver this core service will negatively impact on the network																
WC225 | Footpath renewals	Increased	$177,140	Investment will not improve network resilience	🟡	Minimal increase in footpath renewals will maintain condition of assets	🟡	Safety for non-motorised road users maintained with marginally increased funding	🟢	Increased funding will mitigate defects and maintain customer satisfaction	🟡	An increased maintenance programme may attract greater economy of scale and resultant efficiencies for Council	🟢	Increase will slightly improve aspects of the network and manage future investment demand, similar to 'as is' scenario	🟡	67%	🟡	
	'As is'	$168,705	Investment will not improve network resilience	🟡	Renewal funding will not maintain the condition of assets, but they are subject to minimal deterioration at present	🟡	Risk of trips, slips and falls increases slightly where quantity of renewals cannot match deterioration	🟢	Existing funding may result in slight increase in dissatisfaction	🟡	Funding in line with previous contracts will likely be delivered to the same level of service as existing	🟡	Funding will maintain the network and manage future investment demand	🟡	58%	🟡	
	Reduced	$64,108	Investment will not improve network resilience	🟡	Decreased footpath renewal funds will negatively impact the condition of the network, but at a gradual rate only	🟡	Risk of trips, slips and falls increases if funding is reduced	🟢	Reduced funding will see increases complaints and dissatisfaction	🔴	A decrease in funding will reduce complexity in the programme, resulting in 'successful' achievement, **but it will be against a lower level of service**	🟢	Decreasing funding will increase future demand for renewals in the long-term	🟡	58%	🟡	Medium-High
Comments	An increase in funding level above 'as is' would have aided in maintaining network condition and customer satisfaction more effectively, given the high profile that defects to the walking network garner from path users; programme severely curtailed																

Public Transport

Asset Group	Funding Level	Asset Quantity	Resilience	Resilience	Condition	Condition	Safety	Safety	Customer satisfaction	Customer satisfaction	Service Delivery	Service Delivery	Financial Impacts	Financial Impacts	Overall Score	Overall Impact	Selected Option
WC514 | Public transport facilities O and M	Increased	$19,783	Level of funding will have minimal impact on network performance	🟡	Level of funding will have minimal impact on asset condition	🟡	Level of funding will have minimal impact on network performance	🟡	Increased capacity to respond timely will have a positive impact on customer satisfaction	🟢	Level of funding will have minimal impact on delivery	🟡	Level of funding will have minimal impact on expenditure	🟡	58%	🟡	
	'As is'	$17,985	Level of funding will have minimal impact on network performance	🟡	Level of funding will have minimal impact on asset condition	🟡	Level of funding will have minimal impact on network performance	🟡	Existing capacity will maintain customer satisfaction	🟡	Level of funding will have minimal impact on delivery	🟡	Level of funding will have minimal impact on expenditure	🟡	50%	🟡	
	Reduced	$0	Level of funding will have minimal impact on network performance	🟡	Level of funding will have a negative impact on asset condition	🔴	Level of funding will have impact on network performance	🔴	Reducing capacity will have a negative impact on customer satisfaction	🔴	A decrease in funding will reduce complexity in the programme, resulting in 'successful' achievement, but it will be against a lower level of service	🟢	Level of funding will have minimal impact on expenditure	🟡	33%	🔴	⇦
Comments	Both the 'as is' and 'increased' funding levels result in a neutral impact on network performance. There is limited benefit in enhancing the programme at this time, but this programme has been declined																

Road Improvements

Asset Group	Programme	Asset Quantity	Resilience	Resilience	Condition	Condition	Safety	Safety	Customer satisfaction	Customer satisfaction	Service Delivery	Service Delivery	Financial Impacts	Financial Impacts	Overall Score	Overall Impact	Selected Option
WC341 | Low Cost - Low Risk	Full	$2,346,305	Investment will not impact resilience	🟡	Investment will improve individual assets through upgrades or replacements	🟢	Safety of road users will be improved	🟢	Customer satisfaction will likely remain static, even with investment	🟡	Level of investment and range of projects will promote procurement of services from multiple parties	🟢	Increased investment is required to deliver multiple projects; assets will demand future maintenance and renewal commitments, but external socio-economic costs will reduce	🟢	83%	🟢	
	Moderated	$1,751,860	Moderated investment will not impact resilience	🟡	Investment will improve individual assets through upgrades or replacements	🟢	Safety of road users will be improved	🟢	Level of funding will have minimal impact on customer satisfaction	🟡	A moderated programme will reduce resource requirement and produce a limited programme, failing to address as many issues	🟡	Moderate programme will require a lesser spend, with associated maintenance and renewal costs in future and limited socio-economic benefit	🟡	67%	🟡	
	None	$0	Lack of investment will impact resilience	🔴	Minimal change to asset condition	🟡	Minimal programme may impact negatively on safety by failing to address issues	🔴	Customer satisfaction will decrease as projects are not progressed	🔴	Lack of a programme will not impact on delivery capability	🟡	Lack of a programme will have no impact on the asset portfolio, but will result in continued high socio-economic cost	🔴	17%	🔴	⇦
Comments	By concentrating on a) maintaining the existing core network performance (through maintenance and renewals), and b) focussing on Issue 3 (safety) the proposed programme was recommended, but declined																
WC357 | Resilience improvements	Full	$917,749	Increase in funds will have a positive impact on network resilience	🟢	The overall condition of the network will be maintained with scour protection treatments	🟡	This investment will have a positive impact on safety	🟡	This investment will have a positive impact on customer satisfaction	🟢	Treatments in line with previous contracts will likely result in successful delivery of programme	🟢	Increased investment will have benefit in reducing future remedial costs	🟢	83%	🟢	
	Moderated	$752,710	Moderate investment will have a postive impact on network resilience	🟢	A limited programme may see a slight reduction in associated asset condition	🟡	This investment will have a positive impact on safety	🟢	This investment will have minimal impact on customer satisfaction	🟡	Treatments less in quantity than previous contracts will likely result in successful delivery of programme	🟢	Limited treatments will see reduced initial costs, offset by increases to manage unprotected assets	🟡	75%	🟡	⇦
	None	$0	Failing to invest in resilience activities will reduce capacity of the network to handle adverse weather impacts	🔴	Lack of investment will reduce scour protection treatment	🔴	This investment will have a negative impact on safety	🔴	lack of investment will result in network access issues that will cause customer dissatisfaction	🔴	Lack of a programme will mean no impact on delivery capability	🟡	Greater damage to unprotected assets will increase future remedial costs	🔴	8%	🔴	
Comments	By concentrating on a) maintaining the existing core network performance, and b) foccusing on issue 2 (resilience) the full proposed programme was recommended but declined- **HOWEVER, the most of the programme has obtained funding via the Crown Resilience Fund**																
WC451 | Walking Improvements	Full	$1,055,551	Investment will not impact resilience	🟡	Investment will improve individual assets through upgrades or replacements	🟢	Investment will provide safety improvements to road users	🟢	Customer satisfaction may increase with investment	🟢	Level of investment and range of projects will promote procurement of services from multiple parties	🟢	Increased investment is required to deliver multiple projects; assets will demand future maintenance and renewal commitments, but external socio-economic costs will reduce	🔴	75%	🟡	
	Moderated	$840,256	Moderated investment will not impact resilience	🟡	Investment will improve individual assets through upgrades or replacements	🟢	Investment will provide safety improvements to road users	🟢	Customer satisfaction will likely remain static, even with investment	🟡	A moderated programme will reduce resource requirement and produce a limited programme capable of being delivered but failing to address as many issues	🟡	Moderate programme will require a lesser spend, with associated maintenance and renewal costs in future	🟡	67%	🟡	
	None	$0	Lack of investment will not impact resilience	🟡	Lack of investment will have no impact on asset condition	🟡	Lack of investment in this programme will likely result in increased risk to road users	🔴	Customer satisfaction will decrease as projects are not progressed	🔴	Lack of a programme will not impact on delivery capability	🟡	Lack of a programme will have no impact on the asset portfolio	🟢	42%	🔴	⇦
Comments	New footpaths had been prioritised to complement forthcoming (substantial) subdivision developments) and continuation of projects identified under to Council's Walking and Cycling Strategy, but declined																
WC452 | Cycling Improvements	Full	$4,116,262	Investment will not impact resilience	🟡	Investment will improve individual assets through upgrades or replacements	🟢	Investment will provide safety improvements to road users	🟢	Customer satisfaction will likely improve	🟢	Level of investment and range of projects will promote procurement of services from multiple parties	🟢	Increased investment is required to deliver multiple projects; assets will demand future maintenance and renewal commitments, but external socio-economic costs will reduce	🟡	83%	🟢	
	Moderated	$1,646,505	Moderated investment will not impact resilience	🟡	Investment will have minimal impact on condition of associated assets	🟡	Investment will provide safety improvements to road users	🟢	Customer satisfaction will likely remain static, even with investment	🟡	A moderated programme will reduce resource requirement and produce a limited programme capable of being delivered but failing to address as many issues	🟡	Increased investment is required to deliver multiple projects; assets will demand future maintenance and renewal commitments, but external socio-economic costs will reduce	🟡	58%	🟡	
	None	$0	Lack of investment will not impact resilience	🟡	Lack of investment will have no impact on asset condition	🟡	Lack of investment in this programme will likely result in increased risk to road users	🔴	Customer satisfaction will decrease as projects are not progressed	🔴	Lack of a programme will not impact on delivery capability	🟡	Lack of a programme will have no impact on the asset portfolio	🟢	42%	🔴	⇦
Comments	Focus on the Te Araroa Trail had been prioritised by Council Members for inclusion; however, the updated GPS has severely curtailed active transport mode investment, now focussing on Road Maintenance and Resilience. Programme suspended and funding reallocated to WC's 212, 214 and 357																

MANAWATU DISTRICT COUNCIL

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